Ph.D. Dissertation of Environmental Planning

Embedded Duality in the Implementation of Strategic Environmental Assessment in China

이원화환경에서동서부전략적환경영향평가에대한연구

February2016

Graduate School of Environmental Studies

Seoul National University

Environmental Planning

Ma SA

Embedded Duality in the Implementation of Strategic Environmental Assessment in China

Academic advisor: Yun Sun-Jin

Submitting a Ph.D. Dissertation of Public Administration
October 2016

Graduate School of Environmental Studies
Seoul National University
Environmental Planning
Ma Sa

Confirming the Ph.D. Dissertation written by
Ma Sa
December 2016

Chair Hong Jong Ho (Seal)
Vice Chair Tae-Hyoung Kim (Seal)
Examiner HaeRan Shin (Seal)
Examiner YUN, Sun-Jin (Seal)
Examiner CHU, JANG MIN (Seal)

Abstract

SEA means using the EIA and its relative principles and methods in the strategic (polices, plans and programmes) level (Wood and Dejeddour, 1992). It has “the ability to take account of possible cumulative and induced environmental impacts arising from developments within a defined geographical region’ (Briffett and Mackee, 2003). Even though two significant trends of EIA development worldwide argued by Sadler (1996) are the emergences of SEA into the decision-making process in developed countries and widespread establishment of EA systems by many developing countries. However, most of the SEA research relates to studying the implementation of SEA in the decision making process in developed countries, especially the EU countries. Despite some authors endeavoring to focus on the practices and framework of SEA in the developing countries, it is easy to identify that the gap between the developed countries and the developing countries is broader, in terms of SEA implementation. Even though China is one of the early countries to

introduce the strategic environmental assessment, the duality of western and eastern China is very same with the gap in developing and developed countries. The gaps of eastern and western regions in social and economic development, such as the gap in GDP, incomes, economic marketization and openness, the level of non-nationalization, the scale of government which lead to the different government policies and policy implementation cause the SEA outcomes are different. Even though the duality of eastern and western China in economic and social development that caused by dual national strategies and historical and geological reasons is widely discussed, the duality in environmental policies and environmental policy implementation, especially the SEA policies, of eastern and western regions results from the social and economic development gaps is never mentioned in the previous researches.

This research is focused on the implementation gap of SEA in China, due to the unbalanced development of the western and eastern regions that are under the same institutional framework and to answer that what

reasons are resulted in the SEA in the western region failing to be implemented as well as in its eastern counterpart and in which respects the duality influences the SEA implementation in western and eastern China. The in-depth interview and reviewing government policies are selected as two main research methods. Government policies review reflects under the background of duality economic and social development, when making environmental policies and SEA policies, both central government and local governments pays different attention of environmental protection, which large influence the further government's attitudes to PEIA, their value of environmental protection etc. and in-depth interview could provides a more complete and detailed picture of the PEIA implementation process that do not have significant causality and provide "more relaxed atmosphere in which to collect information. A total of 32 interviewees are integrated from the environmental provincial protection bureau (EPB) and the district environmental protection office (EPO), experts from EIA evaluation institutions, professors of a university, staff from economic development

zone committees and the public, who participated in the evaluation process. Four case provinces are selected according the economic and social development criteria. They are Guangdong and Jiangsu in eastern region and Qinghai and Ningxia in western region.

The research finds that the eastern region has an obviously better performance in PEIA implementation in the nine aspects discussed in the research, according to both the environmental protection department staff and the SEA institutes' staff. The western provinces face significant disadvantages and strong barriers of PEIA implementation in almost all of the items including putting too much value on economic development, imperfect local PEIA policies, the weakness of the power of the voice of the environmental protection departments in government negotiation, weak management of PEIA, less valid public participation and the imperfect public participation forms. Some strong advantages leading to successful PEIA implementation are: give an important value of environmental protection and relative complete local PEIA policies, the financial and

human resource and valid public participation. These four elements guarantee successful PEIA implementation in the eastern region and the barriers of the implementation of PEIA in the western region. In addition, the PEIA implementation results in the eastern region are influenced more by policy implementation and the implementation results in the western regions are deeply affected by the policies in the western region. Unlike the successful PEIA implementation outcomes in the eastern region depending either on sufficient policies' supporting or good implementation performance, the problems of the PEIA implementation outcomes in the western region are firstly based on less valid and sufficient policies. In addition, it can be seen that the performances of the PEIA implementation in the western region have both the low policy supporting and the PEIA policy implementation and the results coordinate with the imperfect implementation

Keyword: duality, SEA (Strategic Environmental Assessment), EIA (Environmental Impact Assessment), implementation, policy

Student Number: 2014-30826

Table of Contents

Chapter one: introduction

1. 1 Research background

1.1.1 From EIA to SEA

Since it was put forward in Canada at the International Environmental Quality Conference in the year 1964, the EIA (Environmental Impact Assessment) has received international adaption in the rest of the world (Li, 2008). The EIA, defined as "a legislated and regulated procedure for assessing the environmental effects of proposed actions" (Lawrence, 2003), is considered as one of the most successful environmental policy innovations. Up until 1996, it had expanded to over 100 countries in the world (Lawrence, 2003). However, the environment is continually becoming degraded, despite this wide adoption of the EIA (Briffett and Mackee, 2003). Both researchers and the governments began to agree that environmental disasters caused by improper planning and policy would cause larger and broader negative influences on the environment. Merely solving the environmental problems at project level is not sufficient to deal with indirect and cumulative environmental and social influences. In addition, the concept of sustainable development, derived from the Brundtland Report, *Our Common Future*, was put forward in 1987. Then, the Agency 21, published five years later, required a comprehensive consideration of economic development, social development and environmental protection. The Strategic Environmental Assessment (SEA) that has

been argued as being an effective way to achieve sustainable development and to co-ordinate environmental protection with economic and social development has been receiving increasing global attention.

Generally, Strategic Environmental Assessment (SEA) means using the EIA and its relative principles and methods in the strategic (polices, plans and programmes) level (Wood and Dejeddour, 1992). It has "the ability to take account of possible cumulative and induced environmental impacts arising from developments within a defined geographical region' (Briffett and Mackee, 2003). The SEA could also "evaluate and anticipate the consequences of decisions taken before the project stage" (Briffett and Mackee, 2003), integrate environmental aspects into the strategic decision-making process (Therivel, 2004) and "make the world a greener and resource-intensive formality" (Therivel, 2004). In addition, the roles of SEA, as a means of decision-making, and the predictive and participatory environmental management tools are heavily valued (Ma, 2016). SEA faces the whole process of decision-making and, instead of solely inheriting traditional experts, It has consultations and builds the platforms for encouraging communication among stakeholders and different governments.

As stated by Sadler (1996), there are two significant trends of EIA development worldwide: the emergence of SEA into the decision-making process in developed countries and "widespread establishment of EA systems by many developing countries". Since the EU directive on SEA was adopted in 2001, being enforced in 2004 (EC, 2001), the SEA has been obtaining increasing attention in

both theoretical and practical fields. However, most of the SEA research relates to studying the implementation of SEA in the decision making process in developed countries, especially the EU countries. As mentioned by Retief et al. (2008), strategic environmental assessment has been the greatest within the context of developed countries and, subsequently, the majority of research and literature also reflects a developed country perspective. Although it is the developing countries that suffer from serious environmental problems and ecological degradation, few SEA researchers, however, have given attention to the developing countries.

"There still is less information for less developed countries" (Lee and George, 2013) and, despite some authors endeavoring to focus on the practices and framework of SEA in the developing countries, it is easy to identify that the gap between the developed countries and the developing countries is broader, in terms of SEA implementation.Clive Briffett (2003) reviewed the EIA legislation, procedures and practices in the environmental planning of six developing countries and argued that there remains the need for developing countries to integrate SEA into their decision-making process, since the 'natural environment in Asia has continued to be severely degraded, despite the adoption of EIA', and the implementation of a 'well-refined westernized model of SEA' is weakly present. Zhu and Ru (2008) examined the motivations of the SEA practices in China, through reviews and interviews that took place in 2005 and 2006. They found that the 'bureaucratic politics between the environmental and non-environmental ministries limited the legislation and implementation' of SEA and the non-

environmental ministries restricted the integration of environmental assessment at the policy level. The question of whether the western style EIA can be translated into the decision making process of developing countries successfully, or whether it may be "too bureaucratic, mechanistic and voluminous", has also been raised (Petts, 2009), pointing to the implementation gap between the developed countries and developing countries.

1.1.2 Duality in western and eastern China

The gap between the developed and developing regions can be partly described as "duality", although it should be judged case by case, by analyzing the broader, and the ranges of, gaps. Duality is the concept previously used in the economic field to reflect the exiting of advanced modern industries and traditional agriculture at the same time, after researching the economic development of developing countries (Lewis, 1957). Then the range extended to the gap between the central business districts and peripheral areas of one city, developed regions and developing regions (Liu, 2011) and was relative to various kinds of research areas, such as income distribution, technology development and the labor market, etc. (Xu, 2012). Duality is also discussed in the philosophy field and was first put forward in ancient China two thousand years ago. Hegel and Descartes, as representatives of western philosophy and who established the dichotomy philosophy dominated by two opposing sides, subject-object, have deeply influenced the later research that is focused on two opposite and mutually

connected parts.

China’s western and eastern regions have the significant characteristics of duality that is mainly caused by national strategies and preferential policies that stimulate unbalanced development. The country woke up from its socialism utopia dream and recognized that poverty is not socialism and that government control and market control were both indispensable in the economic system in the year of 1978, which was marked as the starting year of market economic reform. Being restricted to limited resources and the shock of the “cultural revolution” that eliminated all elements related to capitalism and seeked for true communist ideology and was then judged as being “responsible for the most severe setback and the heaviest losses suffered by the Party, the country and the people since the founding of the People's Republic", the national development strategy thus encouraged marshalling the full resources of the country to develop some regions and some people in the eastern region and expected the developed eastern region to help the development of the western areas that had not received much financial and political support in the end. However, along with the significant economic development in the eastern region, the gap between the western and eastern regions became wider, rather than bridged

The most significant differences between western and eastern China are in economy and policies, and then in culture, society and the environment. Then, in return, the duality of economic, social and political development duality also leads to the gap in regional policies and policy implementation, especially the

environmental policies, since the effectiveness and implementation of the policy and the regulations of the environmental protection policy largely depend on the economic development standards of the corresponding areas (Che, Shang and Wang, 2001). For example, the environmental pollution accident in China shows a certain spatial difference. Between the years 2000 and 2012 4837 and 7800 environmental pollution and damage accidents happened in eastern and western China, respectively, accounting for 28.2% and 45.5% of the total environmental pollution accidents (Cui, 2015), as shown in the table below.

Tab1-1. The spatial distribution of environmental pollution and damage accidents

Eastern region	No.	Eastern region	No.	Western region	No.	Western region	No.
Beijing	1	Tianjin	15	Neimeng	93	Ningxia	35
Shanghai	86	Hebei	109	Chongqing	195	Qinghai	34
Zhejiang	1177	Jiangsu	496	Guizhou	450	Yunnan	975
Shandong	582	Fujian	184	Guangxi	2388	Shanxi	470
Guangdong	683	Hainan	69	Xinjiang	81	Tibet	19
Liaoning	531			Sichuan	1306	Gansu	807

Resource: China Environmental Statistics Yearbook 2000 - 2012

Compared with the eastern region, almost 3,000 more environmental pollution accidents happened in the west and the number in the western areas accounted for almost half of the total national environmental pollution accidents. From 2000 to 2012, the GDP of Jiangsu increased from 858.27 billion Yuan to 5405.82 billion Yuan, increasing from 26.36 billion Yuan to 189.35 billion in Qinghai. During the same period, there were 496 and 34 serious environmental pollution and damage accidents in Jiangsu and Ningxia, respectively. The increase of 9 billion GDP led to

one environmental accident in Jiangsu, but the number was only 4.8 billion Yuan in Qinghai.

1.1.3 Current research gap

Even though the duality of eastern and western China in economic and social development that caused by dual national strategies and historical and geological reasons is widely discussed, the duality in environmental policies and environmental policy implementation, especially the SEA policies, of eastern and western regions results from the social and economic development gaps is never mentioned in the previous researches.

In addition, one of the main advantages of SEA is that it can be used in various kinds of areas with different economic, social and political frameworks. It can be seen that the success of EIA in the US largely depends on its legislation system and action at law, while, in the UK, the implementation of EIA is based on its public negotiation As mentioned by Petts (2009), “Indeed, a positive characteristic of the underlying simplicity of the EIA process is that it allows for adaptive and flexible implementation to meet particular legislative, administrative, social and political circumstances”. As mentioned by Verheem (2010), the application of SEA principles should be different from case to case ‘depending on the varying contexts’, as ‘approaches for establishing SEA requirements have evolved to cater to the political, cultural, legal, institutional and planning context of the concerned country’ (Chaker, 2006). ‘Thus, the very flexible approach of SEA

should be taken, in order to adapt SEA to the many different settings and types of strategic action to which it may relate' (Verheem and Tonk, 2000).

However, authors keep asking the question about whether SEA "is fully valid in all systems and countries worldwide" (Fischer and Gazzola, 2004). For example, Fischer and Gazzola (2004) used content analysis to check the international SEA publication and found SEA has "been developed based on the experiences of some specific countries". By summarising 243 SEA cases, they found international literature had been dominated by the cases of the UK and the Netherlands and NGO, while the cases of other countries are rarely mentioned.

In addition, Caldwell (1989) claimed that, in order to be effective, it has adapted to local circumstances, such as public law and policy. Wanderford-Smith (1989) mentioned the importance of political regimes and the support of courts, chief executives and senior managers, and agreed that state elections in the US are important for the wide acceptation of EIA. As mentioned by Partidario(1996), 'countries with open and flexible political and cultural structures are more likely to have established conditions for the development of sound environmental policies'. Some countries, especially the developing countries, on the other hand, do not have the economic and political background that the developed countries have to support the implementation of SEA. Sánchez and Silva-Sánchez (2008) used highway planning in São Paulo, Brazil, where 'the SEA report failed to satisfactorily take account of significant strategic issues', as a case study to illustrate the vertical tiering SEA and claimed that 'a careful scoping of strategic issues is more than

necessary'. Not the same as EIA, the principles of SEA require opening the views of decision makers and even changing the final result of the decision-making, providing some alternatives and integrating with a large number of stakeholders and the general public (Hales, 2000), which may be hard to achieve in the developing countries without democratic and freedom political circumstances, relaxed government control and awareness of the environmental protection of the public.

Moreover, even though the SEA system has been introduced into many developing countries (China, Brazil and India, for example), most research is focused merely on the legislation and political framework of SEA, and the issues of the implementation process have always been ignored. Although Elsa João (2004) mentioned four barriers of SEA, including "bland alternatives", incomplete public participation, the lack of 'right data and systematic methods and procedure, that study lacks the support of case studies. The misbehavior and deviation in the SEA implementation process has not yet been discussed. Merely solving the problems in the legislation system and procedures may not provide enough support for the SEA practices of the undeveloped areas, or is just the first step.

1.2 Research questions and hypotheses

This research is focused on the implementation gap of SEA in China, due to the unbalanced development of the western and eastern regions that are under the same institutional framework and to answer

1) What are reasons that resulted in the SEA in the western region failing

to be implemented as well as in its eastern counterpart?

2) In which respects does the duality influence the SEA implementation and how do they affect it?

According to the research questions, two hypotheses was made

The dual environmental and SEA policies (including the environmental protection target and management in local economic and social development strategy, different contains in environmental protection law, different environmental standards, different environmental protection mechanism and supporting and management policies) lead to the different outcomes of SEA implementation.

Different agreement on the value of environmental protection and attitudes of local government leaders are the most important elements in determining the SEA implementation outcomes.

1.3 Research methods

Reviewing the existing SEA practices is a common way to gain an understanding of the current development status and issues. For example, Chaker (2006) reviewed the SEA in 12 selected countries to show their SEA practices under the 'European SEA Directive (2001/42/EC) and the United Nations Economic Commission for Europe (UNECE) 2003 SEA Protocol' system and comparatively reviewed 'their respective legal, institutional and procedural frameworks'. Partidario (1999) reviewed the existing SEA processes and practices in different countries by reviewing the literature based on the Canadian

Environmental Assessment Agency database, to ‘understand the existing status’ and ‘practical issues’ of SEA. Judith Petts sets out the objectives of EIA at three levels (2009)： International level, in terms of a comparative assessment of the achievement of international environmental objectives; Nationally (or within an organization) ，in terms of the performance of a system by reference to the policy and institutional functions which EIA is designed to serve; At the micro or process-specific level, in terms of the contribution of EIA to the decision being made.

This research is focused on both environmental policies and the SEA policies in western and eastern China and the SEA policies implementation. At the national level, it critical reviews the current SEA system in China, including the legislation, alternatives and coverage, SEA management and SEA process. At the process-specific level, this research focuses on the PEIA (plan environmental impact assessment) of the economic development zones in four case provinces, by conducting in-depth interviews and reviewing government policies and reports and the PEIA reports of 20 economic development zones and industrial parks.

In-depth interview and reviewing government policiesareselected as twomain research methods. Government policies review reflects under the background of duality economic and social development, when making environmental policies and SEA policies, both central government and local governments pays different attention of environmentalprotection, which large influence the further government’s attitudes to PEIA, their value of environmental protection etc. In

western and eastern provinces, the policies are difference in environmental policies and regulations, environmental protection standards, environmental protection mechanisms and SEA institutes management and monitoring data quality policies. A total of 32 interviewees are integrated from the environmental provincial protection bureau (EPB) and the district environmental protection office (EPO), experts from EIA evaluation institutions, professors of a university, staff from economic development zone committees and the public, who participated in the evaluation process. Each interview lasted for at least one hour. In order to avoid bias, multiple resources of data are selected, same questions are asked in different forms more than once to ascertain interviewees really ideas and the same questions are asked in different agencies.

The in-depth interview is selected because this research focuses on not only the dual environmental policies and SEA policies but also the policy implementation. It provided the "detailed information about a person's thoughts and behaviors" and offer a "more complete picture of what happened and why"(Boyce and Neale, 2006). It is helpful especially for the analysis of embedded duality in policymaking and implementation process that do not have significant causality and provide "more relaxed atmosphere in which to collect information" (Boyce and Neale, 2006). However, although the author tries to avoid bias by informing them that no personal information is disclosed and that no information in the paper could be used to track them, asking the same questions more than once and trying to not guide them in the interview and allowing them to talk, the

research is relative to the performance of the government and the issues in the government working and what has been done above in other countries, in conducting the interviews, for example, some of the interviewees kept changing their views, bringing difficulty to the research. In addition, the interviewees may attend and talk what they perception instead of what they really do in practices. When doing this research, author tries to ask for statistics or other datato support their views and what they really do when and where and tries to transcribe facts instead of their feeling. For instance, one interviewees keep talking they do very well in organize public participation and the author change the question to asked specific questions such as what forms, when and how they organize the public participation instead of semi-open questions like what his/her view of the implementation of the forms

Tab1-2. The main research methods in each chapter

Chapter	Methods
Chapter one: introduction	Literature review
Chapter two: duality and the dual economic and social development in China	Literature review, statistics
Chapter three: dual policies and policy implementation theory	Literature review, government report/policy review
Chapter four: SEA in China	Literature review, policy review, government report review, statistics
Chapter five: the embedded duality in SEA implementation	Case study, AHP (Analytic Hierarchy Process) analysis, statistics, interview, comparison analysis, PEIA report view
Chapter six: conclusion	

Resource: author drawn

1.4 Definition of main concepts

EIA: Environmental impact assessment (EIA) is well accepted as "the process of identifying, predicting, evaluating and mitigating the biophysical, social and other relevant effects of proposed development proposals prior to major decisions being taken and commitments made" descripted by IAIA (International Association for Impact Assessment) in 2009. In general, "EIA is a systematic process that examines the environmental consequences of development actions, advance" (Glasson, Therivel and Chadwick, 2013)

SEA: Strategic Environmental Assessment (SEA) means using the EIA and its relative principles and methods in the strategic (polices, plans and programmes) level (Wood and Dejeddour, 1992). As mentioned by Sadler and Verheem (1996), SEA is "a systematic process for evaluating the environmental consequences of proposed policy, plan and programme initiatives" and their alternative purposes. Completing the SEA reports and using the consequence of assessment are also included in the process.

China regional division: After the economic reform in 1980s, in order to strengthen the national strategies on the role of regional economic development and the macro control of economic and social development in different regions, China government of divided the state into three regions: eastern, central and western regions. This division is widely used in making government strategies and in government statistics and other government report.

Western China: includes twelve provinces, municipalities and autonomous regions named Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang, Sichuan, Chongqing, Yunnan, Guizhou, Guangxi, Inner Mongolia and Tibet. Land area of the region is about 6.81 million square kilometers, accounting for 71% of the total land area of the country.

Eastern China： contains eleven provinces and municipalities Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Hainan. The eastern region is 916 thousand square kilometers, accounting for 9.5% of the overall land of the country.

Central China：Central China includes eight provinces named Heilongjiang, Jilin, Shanxi, Anhui, Jiangxi, Henan, Hubei, Hunan. It occupied around 19.5% of China's land areas and is the home of 35% nation's population.

Duality: In this article, the author defined duality as the development gap of the western and eastern regions, in terms of economy, society and policy. It was caused by, not only historical and geological factors, but was also promoted by unbalanced national policy. The national policy had the tendency to develop the eastern region firstly, leading to duality in the economic development standards, economic marketization and openness. The gap of social and economic development leads to the different environmental policies especially SEA policy and different policy implementation, which finally cause the different outcomes of SEA

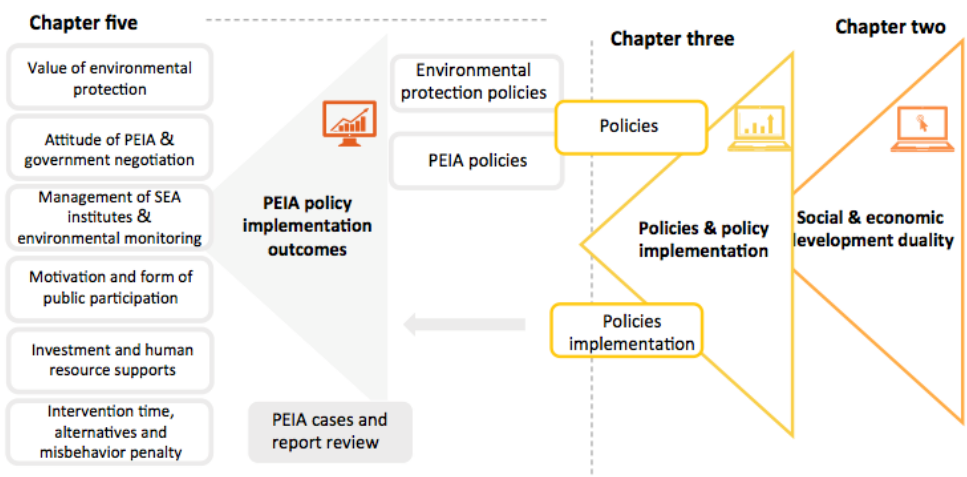
1.5 Research scope and framework

By using case selection criteria, four provinces are selected in the research. They are Guangdong and Jiangsu located in the Eastern China and Qinghai and Ningxia located in in Western China. Qinghai spread on the northwestern of Tibetan Plateau that is the plateau with the highest altitude in the world. The average elevation of Qinghai is over 3,000 meters above sea level. The province have the important environmental strategy meaning because it is the water resource for three main river in China named Yellow River, Yangtze River and Lancang River. Ningxia is locates in the upper reaches of the Yellow River in Western China. The area of the province is 66.4 thousand square kilometers. Jiangsu is located in the center of eastern coastal China and the downstream of Yangtze River and Huaihe River and constitutes the Yangtze River Delta metropolitan areas and become the one of the six metropolitan areas in the world (Xinhua News, 2012). Guangdong is the fastest developing province in economy and rank top one in China's economic aggregate. From economic openness in 1978 to 2012, according to the absolute number, the amount of GDP of the province increased 307 times

The thesis includes six chapters (fig.1-1). Chapter one provides information on the research background, discusses the gap in the current research and then summaries the significance of the research and raise research questions. Chapter two focuses on the social and economic duality in western and eastern region in terms of economic development standard, economic marketization and openness and social development that caused by unbalanced national strategies and policies

and historical and geological reasons. Then, the following chapter provides a framework for analysis the gap in both policy making and policy implementation including the different implementation subjects, government structure, ability and supervision. Chapters four provide the overall picture of SEA in China including the SEA management and process. Chapter five deeply analyzes dual environmental protection polices in eastern and western region by using Qinghai, Ningxia and Jiangsu and Guangdong as case studies involving dual national environmental strategies, dual environmental polices and standards and dual supporting and management polices, and PEIA polices in four provinces. Following by PEIA case description, the paper analysis the difference in value of environmental protection, attitude of PEIA and government negotiation, institutions management and monitoring data, financial and human resource supporting etc.

Fig1-1. Research structure



Resource: author drawn

Chapter two: duality and the dual economic and social development in China

2.1 Duality

2.1.1 The conception of duality

The conception of “dual economy” was first put forward by the American economist W.A. Lewis. Based on his research of the economic development of developing countries, he stated in his most influential article in 1957, “Economic Development with Unlimited Supplies of Labor", that, in the economic structure, there exists relatively separated economic operation departments: the traditional agricultural sector and the modern industrial sector. “There are two different types of institution, technology and mechanism, existing at the same time in a nation’s economic system” (Zhang, 2012) Dual economy is a common process when developing countries are under the process of economic development (Feng, 1988). Unbalanced regional development is not a phenomenon unique to China, as almost all undeveloped countries in the world face gaps between different regions (Tang, 2000). For example, the gap between eastern France and western France resulted in the terms “the rich and industrial France” and “the poor agricultural France”, and among the largest 500 companies and enterprises, 476 of them were located in the west (Tang, 2000).

According to neoclassicism, the occurrence of duality and unequal income

between regions is caused by the failure of the balance mechanism. The imperfect market blocks the flow of resources and an effective allocation of resources. However, with economic development, the market failure will tend to disappear, because of the more concentrated market resources and the connections among regions. The gap can decrease when the undeveloped economy is headed towards its own sustainable growth and economic maturity, according to the "Rostovian take-off model" put forward by American economist and historian Walt Whitman Rostow in1960. However, the analysis of duality in neoclassicism cannot avoid critical debates, as it is contrary to the fact that there are gaps in income, employment, productivity and economic growth rates of the regions in the developed countries in Europe, and also in the United States.

The theory of the big-push put forward by Paul Rosenstein-Rodan (1943) emphasized the role of making large-scale investments in various kinds of departments at the same time in the developing countries, or regions. Promoting economic development in these departments can push a high-speed growth and overall development of the whole national economy. Rodan believed that, when concentrating on investing in industrial programs, the barriers to economic development would be avoided by this big-push (Patnaik and Chen, 1990). Providing resources to the modern economic developments means the preference of urban industries, and its motivation, lies in the attempt to absorb the traditional economic activities, and the input of resources causes the economic imbalance. However, the key issues of the length of the transition period are unknown. It

involves duality of the economy and the high social costs mean that it is an extremely painful process. In addition, even by investing a large amount of resources in the modern industry, modernization and integration of the national economy, it still cannot be achieved (Patnaik and Chen, 1990). China's strategy to hold the power of the country to stimulate the industrialization in specific regions, on the contrary, greatly contributes to the duality of the western and eastern regions, which will be discussed later.

However, after the Second World War, an increasing number of economic researchers (such as Gunnar Myrdal and Nicholas Kaldor) started to focus on the "cumulative causation model" and argued that the role of market forces, in general, tends to strengthen, rather than weaken, the imbalance between regions. Because of the cumulative causation, if an area develops faster than other regions because of the initial advantages, thus relying on the existing advantages, it will develop faster in the future. The duality of the regions cannot simply be solved by the market and the unbalance between regions can exist for a long period and, because, of this long period, the power of the "trickling down effects", which means the capital and labors of the backward areas flow to the developed areas, leading to a shortness of resources in the undeveloped areas and further sluggishness of these areas, exceeds the power of the "spread effects", which means the funds and labor resources of the developed areas move to the undeveloped regions and stimulates the economic development of the latter.

"Dual economic theory" is considered as the basic theory and essence of

development economics. From the discussion above, we can see that the study of duality in economy starts from the gap between the modern industry in urban areas and the traditional agriculture in rural areas to the broader range, such as the core economic development zones and peripheral areas, and the gap between developed and undeveloped areas. After existing for decades, the range of the usage of "duality" has been further extended to analysis of urban and rural relations, the labor force market, population growth, income distribution and technology choice (Xu, 2012). For example, Liu Jumin (2011) first viewed the U.S economy as "duality" and argued that, although there is no significant separation of the urban and rural economy, there exists the duality of the rich and poor, "economy for providing jobs" and "economy for booming GDP".

Although "the dual economy appearing in developing countries is an international economic phenomenon in the process of economic development" (Feng, 1988), China experiences a unique economic system. Li Qiang, Dean of the School of Social Sciences at Tsinghua University, said in an international forum on urbanization and urban governance that: "In today's China, we have a very modern metropolis and poor areas. These poor areas, at the same time, have a lower urbanization rate. Thus, it is equivalent to the differentiation into 'Two Chinas'-the rich one and the poor one" (Feng, 2014). At the world economic forum in Davos, Switzerland, which closed on 28 January 2003, former U.S. President Bill Clinton said at the meeting that China is facing its biggest challenge with the gap between the East and the West. This is not only an economic issue, but also a political and

security one. If this problem cannot be solved well, it will drag on the Chinese economy's legs. Morgan Stanley's chief economist Stephen Roach also said that "China in 2002 made a 29% and 17.5% contribution of global GDP and the growth of world trade, respectively, but it also solved three macroeconomic challenges, one of which is the need to stimulate the development from east to west, in order to achieve a more balanced regional distribution of economic system" (Lin and Liu, 2005).

The production and strength of the duality are regulated by the national economic system, which makes the main causes of the duality of China have some significant differences to other countries. In addition, even though the government has acted to reduce the inequality, the gap is broader, rather than bridged. Also, China is a country with vast land. The geological location and historical economic development background are different amongst regions. Some areas in the eastern part have experienced nearly a hundred years of development and growth of the industrialization, while in some parts of the west, the industrialization appeared only two or three decades ago (Feng, 1988).

The duality can also be viewed from the aspects of philosophy, which is used to describe two parts of things that are separate and mutually associated with each other. Duality, or dichotomy, has a much longer period and wider coverage in the views of philosophy. Two thousand and four hundred years ago, Zhuangzi, who is a Chinese philosopher, said that "A foot wood stick, take half of the stick each day, it can never take out". Western philosophy from Plato to the Descartes, and to Hegel,

gradually established the philosophy dominated by the “dichotomy of subject-object”. Some other philosophers, such as Feuerbach, conducted further studies of duality and dichotomy and have deep influences (Yang, 2005). The dualities of thinking and being, subject and object, essence and phenomenon, rationality and sensibility, individual and general, unity and opposition, difference and identity, concrete and abstract, present and absent, and ancient and modern commonly exist in the study of philosophy (Zhang, 2002). From this aspect, duality has a much broader coverage. Many researchers in other research fields accept this view and use “duality” to analyze two things that are opposite and mutually connected. For example, Wang (2015) analyzed the “duality of social organization” and used “duality” to emphasize the administrative power and the public character of a social organization. He also mentioned that Article 2 of the Constitution states: “achieve the duality of the social organization to manage state and social affairs by joining or organizing social originations”. Ye (2011) used “humanity’s dualism” to identity the virtuousness and viciousness of human nature in *Vanity Fair*, an English novel written by William Makepeace Thackeray in the late 1940s. Zheng (2007) used the duality of two kinds of power, namely religion and military and policy, existing in the time of the Taiping Heavenly Kingdom in the history of China.

2.1.2 The duality in the west and east in China

The duality of the west and east is a common concept in academic and

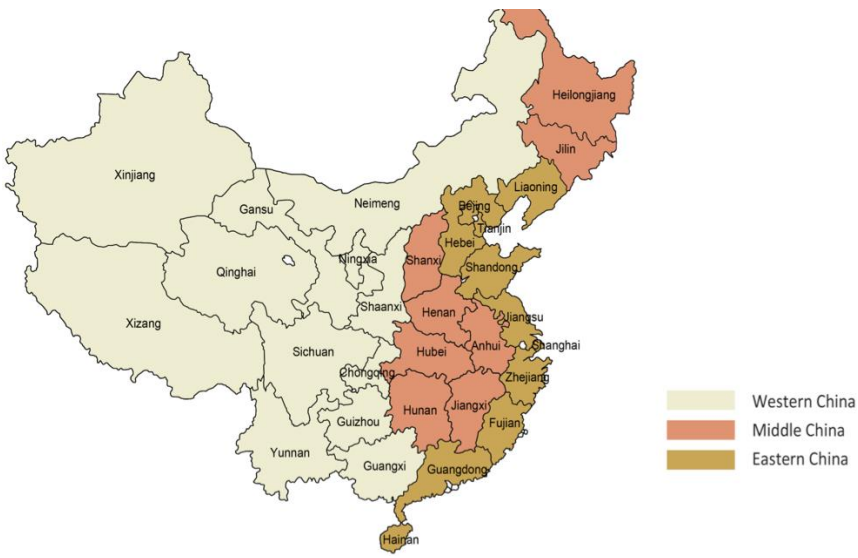
political fields. The Chinese Sixteenth Congress of the Communist Party's political report, the fourth amendment and implementation of the Constitution and the introduction of the national macro-control strategies attempted to solve the growing gap between the rich and poor, the urban and rural and the west and east (Xia and Ye, 2005). Mao (1996) mentioned that “the ratio of investment in fixed assets per capita in the richest region, Shanghai, and the poorest region, Guizhou was nine times in 1984, 11.6 times in 1990, 14.9 times in 1993 and increased to 21.2 times in 1994”. In some towns in Guizhou the average annual financial income used to be only half of the salary of government officials. It has to be said that it is an undisputable fact that China has a more serious social duality. In this research, the author argued that the duality of Western China and Eastern China reflects on the economic duality of both the west and the east, such as the unbalance in economic development, openness of the market and economic system caused by historical factors, geological reasons and, especially, guidance of the national strategies, and the duality in society and culture, policy and other areas based on the duality in the economy.

2.2 The concept of Eastern China and Western China

In this paper, Western China is made up of twelve provinces, municipalities and autonomous regions, named Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang, Sichuan, Chongqing, Yunnan, Guizhou, Guangxi, Inner Mongolia (or Neimeng) and Tibet. The land area of the region is about 6.81 million square kilometers, accounting for 71% of the total land area of the country. The population size is 365

million (in 2008), occupying 28% of the population of the whole country. The population density is 53.2 people per square kilometer. The western region is the main residential district of the minority nationality in China. Although Western China has a vast territory, “most parts are undeveloped and the development of the region needs to be strengthened.

Fig 2-1. The location of eastern, central and western China



Resource: Author drawn

Eastern China contains eleven provinces and municipalities, namely Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong and Hainan. The eastern region covers 916 thousand square kilometers, accounting for 9.5% of the overall land of the country. There are 479.6 million (in 2008) people resident in the east, making up for 36.7% of the nation’s population. The population density is 523 people per square kilometer, being ten times higher

than the west (Peng, 2010).

Central China includes eight provinces, named Heilongjiang, Jilin, Shanxi, Anhui, Jiangxi, Henan, Hubei and Hunan. It occupies around 19.5% of China's land area and is the home of 35% of the nation's population.

The concept of Eastern China and Western China does not only have a geological definition, but also has economic and social meanings. There are differences in the topography and climate, economic and social development, marketization level and degree of opening to the outside world, education level, industries and the national policy's inclination.

There are three kinds of regional administrative divisions at the first-level administrative subdivision in China. They are provinces, direct-controlled municipalities (Beijing, Shanghai, Tianjin, and Chongqing) and autonomous regions (Inner Mongolia Autonomous Region, Guangxi Zhuang Autonomous Region, Tibet Autonomous Region, Xinjiang Uyghur Autonomous Region, and Ningxia Hui Autonomous Region), in which the minority ethnic group is concentrated. The population of the minority ethnic group accounts for a relatively high percentage and have special administrative regions (SERs) (Hong Kong and Macau) that operate under a capitalist economy. Since SERS have their own law and political system, they are excluded from this research.

Following the economic reform in the 1980s, in order to strengthen the national strategies on the role of regional economic development and the macro control of the economic and social development in different regions, the concept

emerged of dividing China into three regions: eastern, central and western regions of China. Eastern China includes eleven provinces and direct-controlled municipalities, named Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong and Hainan. Central China includes ten provinces and autonomous regions, which are Shanxi, Inner Mongolia (or Neimeng), Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, Hunan and Guangxi. Western China contains nine provinces and autonomous regions, named Sichuan (including Chongqing), Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang. This kind of division method was first passed in the fourth session of the Sixth National People's Congress (NPC) held in 1986 and was officially announced in the "The Seventh Five-Year Plan" (Li, Zhao and Zhao, 2016). At that time, the standards and principles of separating into three economic regions were a combination of economic standards and geographic location. "Mainly based on the economic level, those municipalities and autonomous regions have the same economic and technological development level and consistent geographical location and are classified as one type (Yang, 2007).

At the fifth meeting of the eighth session of the NPC in 1997 it was decided to establish Chongqing municipality (that previous belonged to Sichuan province) and class it within the western region, resulting in the provincial administrative regions in the western region increasing from 9 to 10. Since the level of the per capita GDP in the two autonomous regions ofInner Mongolia and Guangxi was equivalent to the average level of 10 western provinces (city, district), in 2000, when the country

announced the “China Western Development” strategy, in order to cover the range of preferential policies in these regions, Western China expanded its range to Inner Mongolia and Guangxi.

There are also some other regional unit division methods, for example the dichotomy method separated the nation into coastal and inland areas. In order to reflect the social and economic development in different regions in China , the National Bureau of Statistics divided the nation into the four regions ofEastern, Central, Western and Northeastern regions, according to the "CPC Central Committee and the State Council advices on promoting the rise of the central region” and the “State Council issued some advices on the implementation of western development policy” in the year 2011 (Li, Zhao and Zhao, 2016). On the basis of this, in 2013, the Ministry of Education, National Development and Reform Commission (NDRC) and the Ministry of Finance further separated 12 provinces of the western region (autonomous regions and municipalities), 6 provinces of the central region, 3 provinces in Northeast China and 2 provinces in the eastern region (Hebei Province, Hainan province) as the Midwest Region in the “Midwestern Higher Education Revitalization Plan (2012-2020)", in order to produce, and implement, preferential policies of higher education. It can be seen that there was no unique method to divide the country into different regions and separation should be based on the specific aims of research and practices. Among the division methods, the divisions of the three major areas-the eastern, central and

western region-are commonly adopted in studies and occupy an important position in the Chinese regional division system. The regional economic strategies and policies over the years are also in accordance with the pattern of these three major regions (Lu, 2004).

In this paper, the author argues that the gap between western China and eastern China deeply coincides with the national strategies and policies and also feedback about the differences in the implementation and making of environmental policies and the SEA (Strategic Environmental Assessment). In addition, the duality of the regions appears mainly in the economy, and then in the social, and other, aspects. Thus, the divisions of the three major areas of China and selecting Eastern China and Western China in the research can reflect the duality and its influence on the SEA more clearly.

2.3 The main causes of duality

2.3.1 Unbalanced national strategies

The government policies are the main contribution to expanding the gap between the west and east. In the developing countries, the focus of the economic duality and inequality research concentrates on economic development and considers the policy guidance as the tool to induce this process (Patnaik and Chen, 1990). In China, the difference between the regional policies has undoubtedly become an important factor in the growing gap between the development of the East and West (Lu, 2001). It includes the hukou system after the establishment of

new China and unbalanced economic development strategy after the economic reform in 1978.

Hukou system or the household system was established after the country enacted its strategy to have the high priority to development the heavy industry. The country on one hand, strictly restricts the increase of the city number, on the other hand control the human migration (Zhang, Ren and Zhang, 2010) to solve the disadvantages of heavy industries in attracting human resources. From 1953 to 1957, central government our times published the instructions that require urban and rural household management departments to dissuade and restrict rural population to blindly flow into urban areas. The “PRC households register system” and rural population was rigidly restricted to migrate to cities. In 1975, theconstitution law chancel the articles that residences have the freedom to live and move that mentioned in the first Constitution enacted in 1957. In 1977 “regulation about household migration” at the same time to restrict the rural population moving to urban areas, it also restricts population in town and small city to move to medium and large size cities. Even after economic reform since 1978, government still emphasize restrict of large-size cities and develop small and medium size cities and human resource movement from provinces are still regulated. The hukou system at the time when restrict the migration of human resource, further strengthen the gap between western region and eastern region that have more economic development foundation and opportunities. Human resources in western and eastern regions are like two-closed system. Until now in the western region, the

number of metropolis and large city is limited.

In addition, it should be emphasized that China implemented these unbalanced development strategies (Dong, 2001). After starting the economic reform in China in the 1980s, the paramount leader of China, Deng Xiaoping, who is also the leader of the economic revolution and market-economy reforms, argued that "socialism does not mean shared poverty" and “it is our policy to let some people and some areas get rich first, to guide and help the backward areas”, and mentioned that some areas have rapid development and, thus, mobilize most of the region, which is the royal road leading to accelerating the development and achieving “common prosperity”.

In order to achieve “common prosperity”, "the gradient development" and “regional tilt” polices that were meant to marshal the full resources of the country to develop some regions and some people, were adopted, and prevail, in the country. Thus, national polices and the allocation of resources started to incline in the eastern areas. Starting from the four special economic zones (SEZs), named Shenzhen, Xiamen, Zhugai, Shantou, to fourteen port cities along the coastal areas, then the coastal areas and the areas along the river and along the transport lines, the pace of economic reform and opening gradually speeded up in the eastern areas, while the western regions remained stagnant. The eastern coastal areas have priority in gaining financial investment and police innovations.

1) Financial investment

During the period of the “Sixth Five-Years” (1980-1985), the national social

and economic development strategic plan stipulated that it should actively use the existing economic base of the coastal areas, to promote the development of the mainland economy. In the “Seventh Five-year plans” (1986-1990), the concept of Eastern China, Central China and Western China was mentioned for the first time to alternate the division of the coastal areas and inland areas. This plan further stressed the need to follow the sequence of development priorities according to the eastern, central and western regions (Gao, 2003). Thus, the national infrastructure investment began to significantly incline to the east areas. During the “Sixth Five Years”, the investment of the infrastructure in the eastern, central and western areas accounted for 47.7%, 29.3%, 17.2%, respectively. The investment of Eastern China exceeded, for the first time, the sum of the west and central regions. Until the “Eighteen Five-Years” (1990-1995), the proportion of the infrastructure investment in the eastern region increased to 54.2%, and the central and western regions continued to decline to 23.5% and 14.7%, respectively (Zheng, 1999).

Tab.2-1. The national investment in the fixed assets of the western and eastern areas

Year	1978	1980	1983	1987	1993	1995	1998	2005	2010	2014
East	59.9	62.8	51.2	55.9	61.8	63.8	59.7	57.2	49.6	47.1
West	13.9	13.7	22.9	21.3	20.2	18.4	21.3	23.3	24.5	23.6

Resource: Author drawn, based on China Statistical Yearbook (1980-2015)

We can see from the table that, even though from 1980 to the end of the 1990s, the national investment to the eastern region increased from 50% to more than 60% and the percentage of the national investment in the western parts continued to

decline. Despite the investment in the fixed assets of the western areas starting to increase from the early 2000s, due to the implications of the China West Development Strategy, it still accounted for less than 25% of the national overall investment and the eastern areas had more than 40% of the investment in the fixed assets. This raises two aspects: first, to further promote the economic development of the eastern region; second, it further weakens the potentiality of the economic development of the western region (Yao, 2004). In addition, the eastern regions received much more financial investment in the fields of science and technology and education and culture, with a relatively higher percentage of investment being contributed to the government and organization establishment and management, which further led to the gap in social development. The strength of the power of the public further decreased the power of the market mechanism and economic autonomy of the western areas.

2) Preferential policies and system innovations

As well as the financial investment, the preferential policies and system innovations also led to the unbalanced regional development. The preferential policies that were inclined to favour the east covered both economic openness policies and economic reforming policies.

The policies towards openness outside include:

a) The customs shall give special tariff preferences to the goods imported to SEZs and simplify immigration procedures to facilitate personnel exchanges

b) The foreign trade in SEZs is self-run by SEZs under the guidance of the

national policy

c) To permit the registered banks in Hong Kong and Macao to set up branches in the SEZs and selectively approve foreign banks to set up branches in the SEZs

d) To actively raise funds for construction of the SEZs, using the foreign capital and absorb overseas Chinese, Hong Kong and Macao capital as much as possible.

e) Airports, railways, ports and telecommunications enterprises in the SEZs should be allowed to introduce foreign investment by the SEZs self-owned or foreign investment self-financing forms

The policies towards economic reforming inside include:

a) Planning and construction of the SEZs should be adapted to local conditions

b) Labor wage system should carry out the reform. Employees in enterprises shall implement the contract system. Enterprises have the right to recruit, trial and fire employees.

c) To formulate various regulations of the SEZs

d) The administrative body of the SEZs shall set up and give full the power to make it independently deal with the problem and co-ordinate with all aspects of the relationship

According to the view of Gunnar Myrdal, the normal tendency of the operation market forces was to increase, rather than reduce, the unbalance among areas. The unbalanced national strategies led to inequality and economic

competition. Bai (2000) motioned seven aspects: price, tax, finance, human resources, ownership structure, policy implementation and system of organization. The Central Government had provided the eastern areas with more investment and financial support and tax preference polices to stimulate the economic development of those areas. The capital credit, enterprise listing, capital marketing and other aspects of the preferential policies made the profits from investing in the eastern part higher than in the western. The more feasible household registration system, staff exchange and wave policies increased the advantages of the human resources of the east and it was made compulsory for the talented and well-educated people cultivated by the west to move to the east smoothly. “Before the economic opening and reform, the relationship between the East and the West was basically equal. The level of development of the two is very small. However, due to the implementation of various aspects of the unequal policy, the unequal competition between the East and the West has formed” (Bai, 2000).

In taking the tax policy as an example, five contributory factors are shown below (Huang, 2001).

a) The income tax rate of the enterprises established by foreign investors is reduced by 15% and the enterprises’ profits are tax free in the first two years of starting to earn profits and exempt for half of the tax during the following three years. The “advanced technology companies” and “product export enterprises” can also be given concessions, in accordance with the relevant provisions.

b) A share of the profit obtained from the enterprises can be remitted abroad without

paying income tax on that profit.

c) If the share of profits of the foreign investors is not obtained from the enterprises established in China, but is derived from dividend interest, rents and other income, income tax shall be reduced by 10%

d) The imported and self-used building materials, product equipment, raw materials, spare parts, transportation, office supplies, supervisory unit and personnel carrying imported household items and vehicles of the departments and enterprises established in SEZs and foreign investment enterprises can be exempt from import duties and industrial and commercial consolidated tax

e) Export products produced by enterprises in the SEZs shall, unless otherwise specified by the state, be exempt from export duties and industrial and commercial consolidated tax

The unbalanced preferential policies undoubtedly stimulated the leap of the eastern economy, stimulated the marketization of the economy and increased the foreign trade and economic autonomy. For instance, in the year of 1990, Eastern China absorbed foreign direct investment valued at 2.97 billion US dollars, accounting for 93.99% of the national foreign investment, whilst the percentage of the foreign investment in Western China was only 2.22%. At the end of 1999, the proportion of the foreign direct investment shared by the east shrank to 86.13%, but the west still had a very small share of the overall investment (4.6%), although the number only increased 2.2% (Cai and Dou, 2006).

2.3.2 The physical geography and historical reasons

The vast territory, complicated topography and varying climate of China resulted in the different foundations of economic development amongst the regions. China's eastern and western physical geography differs, which is one of the reasons why it has been difficult to narrow the gap between the east and the west (Tang and Cheng, 2004). China’s terrain descends gradually from the west to the east like a staircase. The southwest is called the "roof of the world", because it is the home of Qinghai Tibet Plateau, which is the global highest average elevation and it is the first stair. Then, the topography goes downward to the east and north with a series of plateau and basin forming the second stair. The eastern parts are dominated by an alluvial plain, which belongs to humid areas with abundant rainfall and fertile land. The water and soil resources are well matched. The natural conditions in the west and in the middle of China are worse than in the east (Chen, 2007). Western China is located in the second and third stairs of China with a high terrain, complexgeological structure and interlaced mountain and plateau. The altitude in most areas is more than 2,000 meters and is even more than 3,000 meters in some areas. There are 601 mountainous counties and hilly counties, accounting for 39% of the country (Yao, 2004). The northwest faces a shortage of water, drought and serious wind sand damage, while the southwest faces a lack of land. Except the Yunnan-Guizhou Plateau, most of the areas of the western area belong to arid and semi-arid land. Especially in the northwest region, the annual rainfall is less than

400mm. The disadvantages of the negative physical geography not only affect the booming of the traditional agriculture in the history and the basic foundation of economic development, but also block the embedding of modern industries and immigration of experts in the western areas.

In addition, China's natural geography has a major feature, in that only the eastern areas are close to the sea, with the remaining three sides being far away from the sea. The western parts, especially, lie in the hinterland of Eurasia. Along more than 19 thousand kilometers of border that is contiguous to 10 countries (Yao, 2004), many backcountries are located in steep terrain regions with backward traffic, and are away from the city center. Limited to the mountain terrain and poor traffic, the residents live relatively dispersedly and closely. The western areas have a higher and more concentrated percentage of the ethnic minority population. There are 49 of the 55 ethnic minority groups living mainly in the west and nearly all of the residents close to the border are ethnic minorities. On one hand, these dispersive places of residence increase the investment on infrastructure and decrease the utilization rate of public resources. Large-scale public services are difficult to be formed. On the other hand, there is less communication and connection amongst the different minority nationalities. The customs and culture are closed in one specific region, without understanding, communicating and dissemination. As well as the geographical factors, from the view of history, three other elements- uninterrupted wars and over explorations, ethnic conflicts and late reaction to the modern industry- are also contributors to the “duality” of eastern

and western China. In the history, Western China, especially the Yellow River basin, was the center of the nation and the cradle of Chinese culture. For example, Xi'an, the capital city of Shaanxi province, was the capital city of 13 dynasties in historical China and was the center of China in politics, economy and society for 1,100 years.

However, because of the transfer of dynasties, the uninterrupted wars and conflicts and the ecological environmental degradation resulting from the reckless exploration and construction, the economic and social center started to transfer from the west to the east in the Song dynasty (year 960-1279). Various lands in the west had been marginalized. In addition, the ethnic minority groups, who had specific religious beliefs and social customs and habits were regarded as a counter-culture and uncivilized by "Han" ethnic groups, or "Huaxia people", who constituted more than 90% of the population of China and were heavily influenced by Confucianism. Many minority nationalities also had a regime at the same level as, or obedient to, China's imperial power. Thus, they were under pressure by Han people and were away from the main land of the country. The contradictions between the nations were very sharp. Many ethnic groups had to move out to the closed and marginal western areas to avoid conflicts and suppression. The western region had a relatively large number and, thus, was considered as the peripheral and backward area. In addition, because of their closed and marginalized live style and lack of communication with the mainstream culture, the social formations and development stages in different areas were quite different. At the time of forming

the People's Republic of China (PRC) more than sixty years ago, some communities still remained in the form of clan communes, where production tools were primitive and iron tools were scarce, and they mainly used wood, stone, bamboo and bone tools. "Slash-and-burn cultivation" was still the main mode of production" and bartering was still dominant in some areas (Zhou, 1998). This traditional culture and consciousness was more deeply rooted and obvious in the west than in the east, impeding its social, economic and cultural development.

During a period of more than 2,000 years, China experienced a feudal society, mainly based on traditional agricultural and the handicraft industry. When it was breaking up in the 1840s, the country experienced a long period of being invaded and oppressed by colonialists. Many national movements, such as the "self-strengthening movement", tried to learn from the successful experiences of the developed countries and to encourage the development of national industry and commerce that had been suppressed in the traditional feudal society. The prosperousness of industry and business mostly occurred in the port cities along the eastern coastal areas, such as Shanghai, Tianjin, Guangzhou and Ningbo, which further led to the economic development of the peripheral areas and broadened the gap between the coastal areas and the inland areas. At the time of the establishment of the PRC in 1949, three quarters of China's industries were concentrated in the coastal areas, especially in several port cities, which had a great influence on the distribution of the economic structure and the layout of the population. The development of the national commodity economy, even under the pressure of

colonial invasion and the conflicts with foreign industries, helped to “promote the rapid expansion of coastal port city and form the economic belts of Shenyang-Dalian, Beijing-Tianjin, Jinan-Qingdao, Nanjing-Shanghai, Guangzhou-Hong Kong” (Yao, 2004) and the basic layout of the duality of China’s eastern and western areas.

2.4 The main expressive forms of duality

“Duality” is one of the most significant characteristics of the economy in modern China (Liu, 2014). Since the foundation of the state, the duality construction in China’s economy is obvious, such as the duality in departments, the duality in areas and the duality between urban and rural (Tang and Cheng, 2004). The duality in regions is especially becoming more prominent. Duality is reflected in various aspects in different regions. Many researchers focus on the differences between the western and eastern parts of China by analyzing statistical data. The coverage includes both the economic development levels and social and cultural factors. For example, Cai (2006)selected three factors: economic standards, construction levels, residents living standards and fifteen sub-factors, such as the retail sales of social consumer goods, investment in fixed assets, the usage of foreign direct investment, international tourism receipts, freight volume, annual passenger volume, per capita housing area and the per capita living water consumption, and found that “the western provinces, in terms of economic level, the level of construction, and the level of people's life, are inferior to the eastern region. The gap between the East and the West has been very serious (Cai, 2006).”

Chen (2002) selected six elements : non-nationalization level, opening degree, market degree (both the degree of marketization of capital and the degree of marketization of labor elements) and the degree on abstract foreign investment and the effectiveness of government intervention (the scale of government officials, wage, administrative expenditure, government fiscal expenditure and consumption). Cai and Dou (2006) selected two aspects of factors to verify the gap between the eastern and western regions. They were the difference in the economic development (GDP growth, fixed asset investment scale and economic benefits and the ability to attract foreign investment) and the difference in the influence of institutions (the degree of market, non- nationalization level and openness). Yin and He (2016) studied the rural and urban household income and found that the income gap between rural residents and urban residents in the western region is broader than in the eastern region. Yang and Liang (2007) researched the “capabilities” and “structural capabilities” of the western and eastern regions. Using the regional competence structure comprehensive evaluation model, they found that the resources allocation capability, opening capability, learning capability and technical capability of the west are obviously lower than the eastern areas’, and the equilibrium structure of the western ability is also weaker than in the east. Peng (2002) compared the scale of higher education, the investment of educational funds and the quality of higher education in the western areas and eastern areas and found that the gap between the higher education investments,

scales and qualities in these two regions was huge.

The duality and unbalanced development between regions has appeared in almost every field in the society, such as in economic standards, gap in incomes, the convenience of infrastructure, the rich degree of education resource and social and cultural actives, environment quality, etc. Some factors that obviously affect the implementation of environmental policies, especially SEA, cover the ranges of economy and society. In this research, the author focuses on the duality in the economic development (GDP and urban and rural resident per capita disposable income), economic institutional environment (economic autonomy and openness) and social development (urbanization rate, education level, government scale, the openness of culture especially the consciousness and cultural of ethnic minority groups) between the eastern and western areas, which are the main contributors to the gap in policy implementation, especially the carrying out of environmental policies, such as SEA.

2.4.1 Economic development standard

When considering the implementation of environment protection, sustainable development and environmental policy, the economic standard becomes an indispensible element. “Generally the description of the institution circumstance of China’s economy depends on three factors, being the denationalization level, openness and degree of marketization put forward by Hu and Yan (1998), or the four factors adding changes in the setup of the economic interest pattern mentioned

by (Jin, 1998) ” (Chen, 2002). The author believes that the economic factors that reflect the “duality” of the west and east relative to decision-making and environmental policy implementation include the GDP and resident per capita disposable income, economic autonomy and openness.

1) The gap in GDP

The economic development level is the foundation of social and political development and has a strong connection with the government motivation and public behaviors. There are various kinds of elements that reflect the economic unbalance between regions and almost all of the social and human development factors are connected with economic development, as it is expressed in the Marxist theory that the “economic base determines the superstructure”. The table shows the percentage of GDP the region has contributed from the starting year of the economic open and reform to 2014. In 2001 the GDP of the 11 provinces in eastern China accounted for 57.5% of all the GDP in the state. The four provinces of Shanghai, Guangdong, Jiangsu and Zhejiang contributed 29.8% GDP to the whole country. The eight provinces in the middle occupied 25.4% of the GDP, with the western provinces (12 provinces) occupying only 17.1%, being lower than the 29.6% and 20.4% in 1980, respectively (Fig.2 and Tab.2). Although in the years 2010 and 2014 the percentages of the western cities increased significantly because of the West Development Strategy, this does not change the dominant role the eastern cities played in China’s economy. In other words, 40% of the country's population in the eastern region had a total of 60% of the country's economic aggregate, while

the other 60% of the population in the central and western regions only contributed 40% of the total economic aggregate (Yang, 2007).

In addition, during the 35 years, the contribution of GDP made by the east increased by 4.1%, while the number in the west was only 1%. The gap between the distribution of national GDP in the eastern, central and western areas increased from 2.4% to 14.7%, rather than decreasing. Supported by national strategies, the eastern region had a higher priority to develop. Furthermore, the GDP per capita in the middle and western provinces occupied only 49.9% and 39.1% of the eastern provinces, respectively, even though the western region had a much lower population density (53.2 people per square kilometer compared with 523 people per square kilometer. as mentioned above).

Tab. 2-2. The percentage occupied in the whole GDP in different regions

	1978	1985	1997	2001	2010	2014
East	51.2	51.9	55.2	57.5	57.3	55.3
Middle	29.6	29.7	26.7	25.4	24.1	24.5
West	19.2	18.4	17.8	17.1	18.6	20.2

Resource: Summary from China Statistical Yearbook 2015

Tab.2-3. The comparison of the economic gross differences among regions in 2014

	GDP (100 million Yuan)	GDP per capita (Yuan/per capita)	Urban per capita disposable income (Yuan/per capita)	Rural per capita disposable income (Yuan/per capita)
East	378728.46	71763.75	33947.18	14497.45
East four provinces	196638.9	78928.75	38932	16942.25
Middle	167522.17	39755.38	24267.25	10118.75
West	138099.79	38798.53	23853.25	8134.08

Resource: Summary from China Statistical Yearbook 2015

2) The gap in incomes

The gap between the urban and rural resident income was also wider. According to the national statistical yearbook, in the year of 2014, the per capita disposable income of urban residents in the east areas was 33,947 Yuan, being 2.3 times higher than the rural residents. On the contrary, the urban citizens had 233,853 Yuan, with only 70% of the city dwellers in the east. The capita disposable income for rural residents in the west was 8,134 and it occupied only 56% of their eastern counterparts and was two-thirds lower than the urban population in the same region. This reflects that the gap in disposable income between the east and west is wide and is much broader in the rural population than in the urban. The difference between the per capita rural disposable income and the per capita urban disposable income in the west is also greater than in the east.

The unbalanced strategies and policies inclination aimed to stimulate the industrial transfer from the east to the west and to achieve the co-ordinated growth of regions by the radiation and driving effects of the east. However, the product elements of the eastern areas were difficult to transfer and flow to the east and the gap between the regions was increasing (Yang and Liang, 2007). In general, not only is the regional economic development gap obvious (Tab.2-3), but it has also become wider, instead of it being bridged following the Chinese economic reform.

2.4.2 Economic marketization and openness

1) The level of non-nationalization

The degree of marketization and the government intervention are the two

factors that reflect the economic autonomy of the region. A low degree of marketization, along with a high level of government intervention, reflects stronger government control in resource management, while a high degree of marketization and relatively loose government intervention shows the more important role of the market in the allocating of resources. 1978 was the year in which China started the reform of state-owned enterprises, breaking monopolies of government and encouraging marketing competition, transferring from the planned economy to the market economy. Even thought the state owned enterprises and market economy had been intensifying reformed, the urban and rural collective enterprises, joint-stock enterprises, foreign investment enterprises, private and individual economy and other non state-owned enterprises had been growing, and in the state-owned economy, the internal shareholding structure had been diversified; “the numbers of the non-nationalization level and economic openness are significantly different in various regions of the country” (Chen, 2002).

The table shows the differences in the non-nationalization levels in the different regions in the year 2014. The eastern areas occupied more than 67% of all the registered private enterprises in China, but the number was only 15.3% in the west. The number of private enterprises and investors was 87.3 million and 17.6 million, respectively, and accounted for 60.6% and 59.5% of the country, respectively, while, in the western areas, there were only 27.8 million employees who worked in private enterprises and 5.8 million investors of private enterprises, occupying 19.3% and 19.5% of the national level, respectively. Regarding the

aspect of industry, only 3.1% of the industrial enterprises were owned, or held by, the government in the east, while the number was four times higher, 12.7% (5853), among the 48,461 enterprises. The state owned and state holding enterprises accounting for the proportion of the total assets of the industrial enterprises above a designated size in the western areas was as high as 57.7%, being 27% higher than the number in the eastern areas (30.1%). In the private industrial enterprises above a designated size, the enterprises in the east accounted for 57.6% of the total assets and 53.3% of the gross profits in 2014, being 30.5% and 41.1% higher than their western counterparts, whose numbers were 20.1% and 12.8%. It is obvious that the nationalization level in the west was still much higher than in the east and the private economic number in the west was lower than in the east.

Tab.2-4 The difference between the non-nationalization levels of the Eastern and Western areas in 2014

	Registered private enterprises No.	No. of employee of private enterprises (10, 000)	The No. of investor of private enterprises (10,000)	Total assets of private industrial enterprises	Gross profit of private industrial enterprises
The State	72266188	14390.4	2963.1	956777.2	68154.89
East	4899580	8727.1	1762.2	551542.25	36319.61
Percentage	67.4%	60.6%	59.5%	57.6%	53.3%
West	1107197	2778.4	578.9	192579.27	10085.51
Percentage	15.2%	19.3%	19.5%	20.1%	12.8%

Industrial enterprises refer to above a designated size (100 million Yuan)
Resource: Summary from China Statistical Yearbook 2015

2) The scale of government

The redundancy government is not only an economic issue, but also has society influences. Too much financial expenditure in administrative management

commonly increases the costs of society and public finance and the pressure for taxpayers, decreases the efficiency of government agencies and institutions and further deteriorates the investment environment.

The size of the government also reflects an increase of administrative power, less autonomy of the citizens and power of the NGO and other social organizations. The author uses the following criteria to reflect the scale of the government: the size of party and government personnel, wage scale of the government and the scales of administrative expenditure, fiscal expenditure and government consumption

(1) The size of the government personnel can be achieved by using the ratio of the number of people who work in state organizations, political parties and social organizations and the number of all the staff and workers in the society. The research shows that out of 100 members of staff, 8.7 of them work for the government. The number is 6.4 in the east and reaches 12.4 in the west, which is almost twice the number in the eastern areas.

(2) The wage scale of the government workers can be reflected by the ratio of the wage of the people who work in state organisations, political parties and social organizations and the overall regional financial expenditure. Out of the 100 RMB of national fiscal expenditure, 10.1 Yuan are used for payment of the wages of the staff of government organizations in the west. This number is 3.09 Yuan higher than in the east (7.01 Yuan).

(3) The scale of the administrative expenditure, fiscal expenditure and

government consumption can be reflected by the ratio of administrative management funds and the regional financial expenditure, the ratio of fiscal expenditure and GDP and the ratio of the government consumption and GDP. In the year of 2014, the State spent 9.5 Yuan on ordinary public services. In the east the number was 8.97 Yuan and was 9.6 Yuan in the west. The gap was 0.63 Yuan between the eastern and western areas. In addition, in order to achieve 100 Yuan GDP, the average fiscal expenditure and government consumption were 21.1 Yuan and 13.6 Yuan, respectively. The fiscal expenditure was 14.9 Yuan and 28.1 Yuan in the east and west, with the west's being two times higher than the east's. Tibet had the largest amount of fiscal expenditure (128.7%) in GDP and ten times higher than in Shandong (12.1%), which had the minimum fiscal expenditure in achieving 100 Yuan GDP. 14.9 Yuan of the government consumption in the west in 2014 increased to 100 Yuan GDP growth, being 3.2 Yuan higher than the consumption in the east.

Tab.2-5. The government administrative scale and expenditures in the western and eastern regions

	The size of government personnel	Wage scale of the government workers	The scale of ordinary public services	The scale of fiscal expenditure	The scale of government consumption
East	6.4/100	7.01/100	8.97/100	14.9/100	11.5/100
West	12.4/100	10.1/100	9.6/100	28.1/100	14.9/100

Resource: Summary from China Statistical Yearbook 2015

3) The gap in economic openness

The economic openness of the areas and their connection with the international market not only shows the economic development, but also reflects

the investment circumstance and marketization of produce and capital resources. In the research, the author used two indexes suggested by Chen (2002): import and export market share and dependence on foreign trade and the attraction of foreign direct investment and foreign investment.

In terms of import and export market share and dependence on foreign trade,in the year of 2014, the total import and export volume of China was 4301.5 billion. The eastern region (according to the location of operating agency) contributed to 85% of them and the volume was 3655 billion, almost 11 times higher than the 334 billion of the west, which occupied only 7.7% of the national volume. The dependence on foreign trade, which can be defined as the total imports and exports, accounted for the proportion of GDP (Chen, 2002)being around 41% of the national level. The economic dependence on exports and imports in the eastern region is around 63%. This reflects the role of the international market in stimulating the regional economy, which was increasing and the recognition of the products in the eastern areas was enhanced. However, the number was less than 16% in the east, which reflects its much more closed market.

Tab.2-6. The import and export market share and foreign investment in eastern and western regions in 2014

	Total volume of imports and exports of goods (USD 100 million)	Foreign investment (USD 100 million)
The State	43015.3	37977
East	36550.6	30797
East (percentage)	85%	81.1%
West	3342.0	3218
West (percentage)	7.7%	8.5%

Resource: Summary from China Statistical Yearbook 2015

Turning to the attraction of foreign direct investment and foreign investment, the gap between the western and eastern areas in the amount of foreign investment was also obvious. Eleven provinces in the eastern region occupied more than 81% (3079.7 billion USD) of all the foreign investment and the twelve provinces in the western areas only accounted for 8.5% (3218 billion USD). Chen (2002) used the ratio of the percentage of FDI (foreign direct investment) and the percentage of GDP to reflect "the power of regional attraction of foreign investment". He found that the power of foreign investment attraction in the east was 1.5, while the western and central areas were 0.26 and 0.36, respectively and concluded that the eastern areas had much more power to attract international investment and had a more open market. This conclusion is also evidenced by Lan (2009), who found that the disadvantages in the size of the market, the market openness degree, infrastructural construction and institutions were the main contributors to the FDI avoiding coming into the western areas.

In summary, the economic development standard and economic institutions are significantly different in the western and eastern regions. The gap between the GDP and incomes, and between the levels of non-nationalization and marketization and economic openness, was broader. The duality was reflected in the aspects that the western region had, not only in the low percentage of GDP contribution and lower economic growth rate, but also in this economic institutional system. For example, it has less economic autonomous and private enterprises, dominated

nationalization companies, large scale of government administrative fees and employees and less attraction of international investment circumstances.

2.4.3 The gaps in social development

Generally, China has achieved a fairly well-off society, but this well-off society is still low-level, uncompleted and unbalanced. “The low-level uncompleted and unbalanced society development concentrates in the western areas” (Lin and Liu, 2005). “Among the 30 million national poverty population, more than 80% concentrate in the West; the areas without the popularization of compulsory education concentrate in the western region; the areas without electricity, road, radio and television, residents’ drinking water concentrate in the western region; the areas with worst health conditions concentrate in the western region…” (Lin and Liu, 2005).

There are a variety of factors that can be used to reflect the unbalanced society development of the eastern and western areas and that conclude that the imbalance of the social development in the east and west of China is wide and the overall development level of the western society is lower than that in the east (Pan, 2003). For example, Zhao and Ye (2005) selected the Human Development Index, including living standards, education level and resident health standard. Chinese Academy of Social Sciences researcher Zhu Qingfang calculated the social development standards based on the population quality, infrastructure condition and research ability index and found that the eastern provinces took the lead in

social development standards and the western regions were left far behind (Pan, 2003). The author selected urban development standards and the urbanization rate, education level, the number of infrastructures and ethnic minority groups as criteria, which play the most significant roles in determining the citizens' and the government managers' views of environmental protection, their motivation of making and implementing environmental protection policies and their skills and knowledge about EA (environmental assessment).

1) Urban development standards and urbanization rate

The city size is the concept to evaluate the size of the cities and it includes the land size and population size. Generally, population size is the decisive indicator of urban size (Pan, 2006) and reflects the concentration of the population and the urban development standards of the region. According to "The Announcement of State Council on Adjusting the Urban Size Division Standard" published in 2014, there were seven city size categories. Mega city means the city contains more than a 10 million urban and suburban non-agricultural population. Metropolis is defined as a city with a total population range of five million to 10 million. The large city I means the city contains three million to five million people and the large city II has a one million to three million population size. The middle city has more than 500 thousand, but less than one million people and small city I and II means the cities have a 200 thousand to 500 thousand population and less than a 200 thousand population, respectively.

Tab.2-7. The distribution of cities, in terms of city size in the western and eastern

regions

	Easter areas		Western areas		The state	
	1984	2014	1984	2014	1984	2014
Megacity	-	8	-	2	-	13
Metropolis	1	34	-	19	1	91
Large city I	3	31	-	28	3	81
Large city II	7	69	4	38	15	162
Medium city	14	88	3	29	31	172
Small city I	30	23	14	35	81	100
Small city II	49	24	23	1	164	36

Resource: Summary from China City Statistical Yearbook 1985 and 2015

The eastern regions exceeded the western areas in terms of the number of small size and medium size cities and the increasing speed of cities. According to the China City Statistical Yearbook, in 1984 and 2014 the total number of China's cities increased obviously from 295 to 655. The eastern region had a high percentage of all types of cities, except small cities. It had a good performance in the number of medium cities (51%) and large cities (41.2%), while the eastern areas had only 16.9% and 27.2% medium and large cities, respectively, and only achieved 33% and 66% of the eastern areas. Although both the eastern region and western region had a distribution of cities at all levels, the number of metropolis and large cities in the west was still limited (except Chongqing and Chengdu located in the southwest). This shows that, despite the vast territory of the west, the number of core cities within the region is insufficient. The number of small cities in the west is larger than in the east, especially the number of cities with a population of less than 200 thousand, which reflects that the urban development standard in the west is still low. In addition, within three decades the number of small cities in

both regions decreased, while the megacity, metropolis, large city and medium city increased to 205 in the east and only 109 in the west, with a gap of almost 100 cities.

Tab.2-8. The increasing number of cities at different levels from 1984 to 2014 in the western and eastern regions

	Megacity	Metropolis	Large city	Medium city	Total	Small city
Easter areas	8	33	90	74	205	-32
Western areas	2	19	62	26	109	-1

Resource: Adjust from table.

The urbanization rate does not only reflect the ways of the economic activities, but also reflects people's life styles, mode of production and social development standards. According to the China Statistics Yearbook 2015, the average urbanization rate in China was 54.77% at the end of 2014. The urbanization rate varies across the 33 provinces. Beijing, Tianjin and Shanghai had the highest urbanization rates at the end of 2014, with the percentages being 86.35%, 82.27% and 89.6%, respectively. Five other provinces had an urbanization rate higher than 60%. They are Guangdong (68%), Liaoning (67.05%), Jiangsu (65.21%), Zhejiang (64.87%) and Fujian (61.8%) and all of these provinces are located in eastern China. In contrast, the provinces located in the west had a relatively low rate of urbanization, such as Xiang (25.75%), Guizhou (40.01%), Yunnan (41.73%) and Gansu (41.68%), which all had an urbanization rate lower than 45%. The urbanization rate of Shanghai was almost 3.5 times higher than the Xizang provinces. On one hand, the rapid population growth created a China that "seriously outstrips the capacity of most cities to provide adequate services for

their citizens" (Cohen, 2006), making it difficult to achieve sustainable development. On the other hand, it reflects the different stages of the social development among the different provinces. China is made up of provinces that are dominated by advanced tertiary industries and areas that are based mainly on traditional handicraft industries and agriculture.

2) The gap in education level

Educational quality and cultural dynamics of the population mainly refer to "the cultural knowledge, science and technology level, production experiences and labor skills, etc" (Zhao, 2008). This is the knowledge that human beings accumulate in the process of understanding and reforming nature and society and the ability of people to gradually obtain from their own understanding and transforming the world (Liu, 1985). Just like the economic development standards, many criteria can be used to evaluate the standard of the educational quality of the population. Some internationally and commonly used criteria include illiteracy rate, average years of schooling, education level, enrollment rates of higher education, enrollment rates of school-age children and educational appropriations, etc. The adult literacy rate index and gross school enrollment rate index can be used to show the general education level of the different regions (Zhao and Ye, 2005). The adult literacy rate refers to the percentage of people aged 15 and over who can read and write a brief statement about their daily life. We can obtain the number of people who have received higher education, technical secondary schools, secondary schools, primary schools and vocational schools from the statistical yearbook, to

find the gross school enrollment rate of the different regions.

Tab.2-9. The illiterate rate in the eastern and western regions

East	1997	2014	West	1997	2014
Beijing	7.9	1.48	Neimeng	16.8	4.66
Hebei	14.3	3.14	Chongqing	16.8	5.12
Shanghai	10.2	3.15	Guizhou	25.9	11.11
Zhejiang	18.4	5.85	Tibet	54.1	39.93
Guangdong	9.6	5.54	Gansu	26.8	8.65
Hainan	14.1	4.42	Ningxia	25.8	8.05
Tianjin	9.8	2.35	Guangxi	15.1	3.6
Liaoning	8.2	1.78	Sichuan	18	7.18
Jiangsu	19.3	5.07	Yunnan	25.2	8.23
Fujian	17.5	5.54	Shaanxi	17.3	5.69
Shandong	22.6	3.07	Qinghai	43.2	13.12
			Xinjiang	11.5	3.25

Resource：Summary from China Statistical Yearbook 2015

During the seven years period, the illiterate rate in both the eastern region and western region obviously decreased. For example, the number in Qinghai decreased from 43.2% in the year of 1997 to 13.1%, decreasing by more than 30%. The illiterate rate in the eastern region decreased by 75% from 1997 to 2014 and the number was 60% in the west. However, in both the years 1997 and 2014, the adult literacy rate in the western region was higher than in the eastern region. In the year of 1997, the average adult literacy rates were 13.8% and 24.7% in the eastern areas and western areas, respectively. In 2014, the numbers decreased to 3.76% and 9.88% in these two areas, respectively. The literacy rate in the west is still 2.6 times higher than the east. “The western areas and eastern areas still have unbalanced education opportunities” (Zhao, 2008). Three provinces in the west, named Tibet (39.93%), Qinghai (13.12%) and Guizhou (11.11%), have an extremely high adult

literacy rate, and this has become a restriction of social development and increase in the quality of the population.

The percentage of educated citizens reflects a region's human quality and social development standards. The author calculated the education level of the population in the western and eastern areas based on the statistics at the end of 2014. In general, the provinces in the eastern areas have a greater number of people with a higher level of education. In the east regions, the people with a junior high school degree occupy 72.7% of the overall population. The number is only 60.4% in the west, being more than 12% lower than the east. In addition, the eastern part of China has a much higher percentage of people who attended universities or colleges and a lower percentage of people who did not attend school. In East China, 13.5% of people received a high education, whilst only 4.6% of the whole population did not receive school education. The percentages are 9.8 % and 7.9 % in West China, respectively. 3.1% more people in the western areas have never received schooling, when compared with in east, especially in Tibet, Gansu and Guizhou, where 44.3%, 13.3% and 10.7% of the population did not attend school. This can also be evidenced by the average education years of the western areas being much lower than the number in the eastern areas. From 2000 to 2005, the average education years of the residents in West China increased from 6.7 to 7, while in the east they increased from 8.2 to 8.6. The average education years of the western areas in 2005 was still 1 year lower than the number of the eastern areas in 2000 (Zhao, 2008) .

Tab. 2-10. The education level of the population in western and eastern China

	Never received schooling	Primary school education	Junior high school education	Senior high school education	Upper college
East regions	4.6%	22.8%	41.4%	17.8%	13.5%
Western regions	7.4%	32.2%	36. 7%	13.9%	9.8%

Resource：Summary from China Statistical Yearbook 2015

The number for high level of talent in the western regions obviously lags behind (Pan, 2003), which is also reflected in the quality of higher education. In the year of 1999, China had 1,017 regular institutions of higher learning, such as universities and colleges. 512 of them were located in the east, while the western areas had only 230 (Peng, 2002), occupying around only 20% of the country. In addition, at the same year, the average number of students in the eastern universities was 4,022.66. This number was 389.83 higher than in the western areas, where the average number of students of each university was 363.28 (Peng, 2002). The average educational expenditure of each student in regular institutions of higher learning in the eastern areas was 7187.86 Yuan in 1998, while the number was 6011.01 Yuan in the west, which is 1176 Yuan lower than their eastern counterpart.

3) The gap in infrastructure

Infrastructure means the public services used to ensure social and economic activities, improve the living environment, achieve sharing of resources and other aims (Jin, 2001), and includes public facilities covering transportation, information, energy, water

conservancy, ecology, environmental protection, disaster prevention, storage and medical and health, etc. (Jin, 2004) . China's vast western region has been a relatively backward infrastructure (Qi, 2015). The reasons are not only that the low economic development standards decrease the local financial resources (Cui, 2013), that they solely depend on government investment and are without marketization of investment and financing mechanisms and there is a national unbalanced development strategy but also the geographical conditions. The restriction of topography and landforms increase the costs of infrastructure construction (Qi, 2015). He Shan, the deputy director of the Qiandongnan Transport Agency, said that the average cost of the construction of highways in Qiandongnan (located in Gansu Province) exceeded 100 million Yuan per kilometer, which is more than twice as much as in the plain area (Qi, 2015) . Even though the rate of the western areas sharing the national investment on urban infrastructure increased from 19.7% in the year of 2000 to 23.8% in 2010, the existing infrastructure construction level is still low (Zong and Xia, 2014).

The author uses the following index to reflect the infrastructure gap between the western and eastern regions

Tab.2-11 The evaluation indicators of infrastructure

Transportation infrastructure	Traffic density railroad (km/km2) Traffic density highway (km/km2) Passenger transport volume (people) Passenger turnover volume (people.km)
Electricity infrastructure	Per capita electricity consumption (KWH)
Communication infrastructure	Branch of the postal service per 10 thousand people Mobile telephone switching capacity per 10 thousand people Internet broadband access ports per 10 thousand people

	Long distance optical cable line density (km/ km2) Fixed line penetration Mobile subscription Internet Penetration

i. The gap in transportation

The traffic density can be used to reflect the transport development level. Traffic density means the length of the traffic line in the unit area. Cui (2013) calculated the railroad and highway density in the western (excluding Inner Mongolia) and eastern regions (without Hannan provinces), based on the 2011 end year data.

Tab.2-12. The railroad and highway density of provinces in the western and eastern regions

East	City	Beijing	Tianjin	Liaoning	Hebei	Shandong
	Railroad	748	767	296	275	273
	Highway	13009	13419	7140	8363	15162
	City	Shanghai	Jiangsu	Zhejiang	Fujian	Guangdong
	Railroad	732	229	175	174	157
	Highway	19181	14839	10958	7611	10596
West	City	Guizhou	Sichuan	Guangxi	Yunan	Ningxia
	Railroad	118	73	54	65	191
	Highway	8967	5884	2722	5597	3691
	City	Shaanxi	Gansu	Qinghai	Tibet	Chongqing
	Railroad	119	54	28	4	167
	Highway	7385	2722	890	514	14406

Unit: km/km2

Resource : Analysis of the economic gap between the East and the West in the view of transportation infrastructure (Cui, 2013)

Even though, according to the preliminary statistics, 12 provinces in the western regions invested more than 600 billion Yuan on traffic construction in 2015

and Guizhou, Guangxi and Gansu achieved their target that "highway covers each country"(Qi, 2015), the western region has a significantly lower density of railroad and highway than the eastern regions. There are three areas with a railroad density higher than 700km per square kilometers, being Beijing, Tianjin and Shanghai, and all of them are located in the eastern regions. On the contrary, six western provinces, namely Sichuan, Guangxi, Yunan, Gangsu, Qinghai and Tibet, have a railroad density lower than 100km per km2. Turning to density of highway, the averages of the highway densities in the western region and eastern region are 12028 km/km2 and 5278 km/km2, respectively. The eastern areas have more than twice as much length of highway in the unit area than the western regions.

Passenger transport volume means the number of passengers the transportation system transfers in a unit time and passenger turnover volume shows the product of the number of passengers and the average distance of one passage in a certain period of time. Guo (2015) summarized the passenger transport volume and passenger turnover volume of the different provinces in the year of 2012, as shown in the following table. Most of the passenger traffic was concentrated in the eastern areas, especially the coastal areas. 169 million people travelled in 2012 in the eastern regions and this number was 91.4 million higher than the west. The transport facilities and transport capacity in the western areas were lower than in the east.

Tab.2-13. Passenger transport volume and turnover volume in the western and eastern regions

East	Passenger	Passenger	West	Passenger	Passenger

	transport volume (million people)	turnover volume		transport volume (million people)	turnover volume (0.1billion km)
Beijing	142.73	421.16	Neimeng	27.63	436.45
Tianjin	27.53	314.66	Guangxi	90.2	1047.98
Hebei	105.06	1369.2	Chongqing	156.54	597.87
Liaoning	103.28	976.99	Sichuan	277.61	1310.25
Shanghai	10.86	182.08	Guizhou	83.53	631.85
Jiangsu	267.71	1872.39	Yunnan	48.46	568.69
Zhejiang	233.12	1317.6	Tibet	3.85	33.46
Fujian	82.04	S56.02	Shaanxi	111.77	897.97
Guangdong	574.3	5.54	Gansu	64.36	666.41
Shandong	265.63	1836.14	Qinghai	12.69	120.97
Hainan	47.12	173.05	Ningxia	16.34	120.97
			Xinjiang	38.33	535.81
Average	169	769.9		77.6	580.7
Percentage	68.5%	57%		31.5%	43%

Resource：Adjust according to Guo (2015)

ii. Electricity and communication infrastructure

The gap between the western region and eastern region in terms of electricity and communication infrastructure is also very broad. The eastern region has relatively advanced infrastructure services and the western region is far behind. “The level of infrastructure of the region is not balanced with its resource advantages” (Gong, 2011). Western areas are full of land and natural resources, but their transportation, electricity and communication infrastructure development standards fall behind the east, which restricts the human, material and information exchange of these areas. The following table reflects the gap between the western and eastern areas in the fields of electricity and communication infrastructure. The electricity consumption per capita in China exceeds the world average level in

general, according to the World Statistical Yearbook of the United States Central Intelligence Agency in 2015. However, until the end of 2005, there were around 2.5 million households, and a total 10 million people, living without electricity. Among these people, more than 95% lived in the western areas (Liu, 2008). It is obvious that the western areas (41.1 million KWH) had less electricity consumption per capita than the east (50.5 KWH) and the gap is almost 10 million. There is not so much difference in the branch of the postal service of 10 thousand people in these two regions. The number in the eastern region (1.13) is a little higher than in the western area (1.05).

Tab.2-14 the gap of electricity and communication infrastructure in the western and eastern regions

	Western region	Eastern region
Per capita electricity consumption	41.1 million KWH	50.5 million KWH
Branch of the postal service 10 thousand people	1.05	1.13
Internet broadband access ports (10 thousand people	22781	38502
Mobile telephone switching capacity (10 thousand households)	56922	93733
Long distance optical cable line density	0.86 km/km2	8.8km/km2
Fixed line penetration	14.9%	25.5%
Mobile subscription	88.7%	116. 2%
Internet Penetration	42.2%	60.1%

Resource：Summary from China Statistical Yearbook 2015

However, the unbalanced development in communication infrastructure is wide, especially in terms of long distance optical cable line density. There is 8.8km length of optical cable line unit area in the east, but only 0.86km in the western areas, which is less than one-tenth of the eastern areas. This restricts usage of the

Internet, the Internet connection speed and the mobile phone information acceptation and receiving of the western residents. Correspondingly, the number of Internet broadband access ports per 10 thousand people in the western areas is only 22781, being 15721 less than its eastern counterpart and only achieves 59% of the number of the eastern region. Mobile telephone switching systems are used for ensuring the quality and the usage of communicating by telephone and transferring information and messages. We can see that in the western areas, the mobile telephone switching capacity was 56922, while the number was 93733 in the east. The eastern region has less mobile telephone switching capacity for 368.11 million households than the east. Accordingly, the western areas have less presentation of fixed line penetration, mobile subscription and Internet penetration, which is 10.6%, 27.5% and 17.9% lower than the eastern areas, respectively.

Chapter three: dual policies and policy implementation theory

Rather than an economic gap, the gap between western and eastern China firstly appeared as a policy gap. Less developed areas are more negative and hesitant to integrate environmental consideration in the decision-making process. This can be partly evidenced by the fact that the developed countries have many more successful experiences of environmental management than undeveloped countries. Most of the studies are focused on how the polices, or strategies, led to the unbalanced regional development (for example the preferential tax policies led to the aggregation of enterprises and investments in specific areas). Research focusing on how the duality, or the developed and undeveloped regions, affected the regional policies differences is very rare. The author argues that duality can affect both policymaking and policy implementation and summarizes four aspects of the duality influence relative to the regional policymaking, especially connected with environmental policies. They are: the influence of the duality on policy innovation, the influence of the duality on public administration and governance, the influence of the duality on preferential policy competition and national strategy and the influence of the duality on personal policy.

3.1 Evaluation framework

Tab.3-1. The comparison of evaluation indicators of policy implementation and environmental policy implementation

	Sources	Evaluation indicators	Sub-indicators

	Zhao (2012)	Static construction of organization	The constitution of origination, the administrative levels in organization, gender rate, the available resources, cultural and the influence of organization, knowledge of staffs
		Static implementation subject	Implementation ability, career-minded, autonomy, experience etc.
		Dynamic construction of organization	Inter organization connection and cooperation with other organization
		Dynamic implementation subject	Implementation ability, implementation innovation, ways prefer, usage
	Feng (2008)	Policy	The achievement of policy value, integrity of target
		Resource	Human resource，qualify of staffs, financial resource, information resource, leader resource, implementation subject
		Methods	
	Song (2006)	Implementation subjects	The quality of implementer, the influence of personal interests
		Target group	The policy propaganda, the distribution of interests
		Policy	The complexity of policy, the rationality, clarity and stability of the policy
		Implementation environment	The policy environmental environment and institutional framework, political culture, economic environment, social psychology environment
	Liu (2006)	Implementation subjects	Balance the interests, ideology and identification, methods (regulations); government structure and cooperation among government
		Social environment and structure	The identification of society; government image, governmental credit；information transfer, supervision
	Ma (2004)	Implementation subjects	The low quality of implementer; benefits distribution, implementation methods, communication and cooperation within and between organizations

		Institutional framework	Power divided among vertical government, function division, personal policy, supervision system
	Huang (2001)	Economy and economic growth; maturity; culture; experiences, government regulations; management commitment; regional environment	
	Sun (2008)	Ability of institution, quality of evaluator (knowledge level, knowledge structure, working experiences etc.), environmental and society influence, index, methods, targets, public participation etc.	
	Cui (2015)	Local policy and legislation, regulations and management system, government official performance evaluation, preferential policy—west development policy	
	Lin (2003)	Cognition and target mechanism, regulation and conflicts mechanism, organization dependence mechanism, supervision mechanisms	
	Yang (2009)	Behavior index	Government behavior, enterprise behavior, public behavior
		Results index	Environmental quality, the rate of environmental accident, the rate of public satisfaction

Resource: Drawn from the literature review and reconstructed by the author

This table shows how the implementation of policy has been studied by many researchers (see above table). The evaluation indicators and sub-indicators commonly argued can be seen in the following figure and the indictors cover policy, policy implementation subject, implementation environment and implementation object. This current study has accepted most of the adopted indictors from previous studies. This research is mainly focused on policy environment and contains policy innovation, public administration and governance, preferential policy and the Western Development Strategy and implementation subject, the implementation circumstances, including government structure, and the ability and supervision in

the western and eastern regions. The indicators are shown in the following table.

Tab.3-2. The evaluation and sub-indicators of the influence of duality on policy

	Evaluation Indicators	Sub-indicators
Policy making	Policy innovation	Policy evolution process, coverage of policies
	Public administration/governance	E-government and government affairs publicity, performance management and public participation
	Preferential policy and national strategy	Transfer of pollution-intensive industries, competition preferential policy
Policy implementation	Implementation subject	Government officers' ideology and attitudes, motivation and benefits balances and personal policy
	Government structure	Vertical organization management, government negotiation at same level, information transfer, personal policy
	Ability	Quality of staffs, technology and infrastructure, data, financial support
	Supervision	Citizens and government responsibility supervision and misbehavior penalty

Resource: author drawn

3.2 The influence of duality on policy making

The gap in policy making of the western region and eastern region is summarized in the following table.

Tab.3-3. The main differences between the eastern and western regions in policy making

Evaluation Indicators	Sub-indicators	Eastern region	Western region	Source
Policy making	Policy evolution process	Bottom-up	Top-down	(Deng, 2001)
	Coverage of policies	Mutual policy systems including both core and supplemental	Consisted of core policies, and lack of	

		policies	other matching system	
	Supporting policies	Mature	Insufficient	(Dong, 2011)
	Mechanism	Command and control regulation & market based incentives	Command and control regulation	
Public administration/governance	E-government and open government affairs	First enacted in some provinces in eastern region and then formulated ate national level, then western region response and follows the requirement of state		(Bao, Liu and Zhou, 2007)
	Public participation	Positive and have clear aim to pursuit	Negative and less motivation	
	Government performance management	Early start and creative models	Late response and traditional model	
Preferential policy and western development strategy	Transfer of pollution-intensive industries	Research and develop advanced manufacturing and modern service industry	Based on advantages on resources and lower labor prices and the cost of environment	(Lin 2014)
	Competition preferential policy and western development strategy		Attract investment and finance from outsider	(Cui, 2015)

Resource: Author summarized according to literature review

3.2.1 The influence of the duality on policy innovation

The EA and strategic environmental assessment (SEA) system is the policy innovation. Even though the development zone planning EIA (environmental impact assessment) and regional development zone planning EIA practices have been implemented since the 1990s, and the SEA legislation came into force in the year 2003, China's SEA system is a reference to the United States and requires policy innovation in the implementation in the state and deals with the imperfect framework and mechanism. In the aspects of policy making, the developed areas have the advantages of the early start and short reaction speed, more completed policies and broader coverage of and regulation systems (both core policy and supporting regulations and administrative measures) and more bottom-up motivation for policy transfer and propulsion.

The supplies of each policy of the country are based basically on the eastern part pilots, such as the reform of enterprise property rights system, and then gradually implemented and promoted in the Central and Western parts (Deng, 2001). There are also some policies that are only allowed in some parts of the western areas, instead of the eastern areas. One example of this is the wage standards system. It is not necessary for the distribution system of the east to follow the wage standards approved by the labor department, while the west has no such autonomy (Deng, 2001). Based on this autonomy, in addition, the policy-making speed in the eastern areas can be much faster than in the west. When there are

requirements, they will have the relative policies (Deng, 2001), which makes the policy produce at a high-speed level. These policies are not only enacted by the central government, but also thanks to the autonomous behaviors. Thus, the policy-making in the east is motivated by the requirements of the location areas that have more of a bottom-up decision-making process.

Policy evolution means the process in which new policies substitute the old ones, when the old ones have impeded one part, or some parts, of the economic and social development. The policy evolution can be divided into induced evolution and mandatory evolution. Induced evolution occurs when the old policy cannot provide profitable opportunities, because of the change of technology, the development of productive forces, the change of production factors, the relative price of products and the change of other institutional arrangements. Since the appearance of new opportunities to make profits, the entrepreneurs and citizens have been seeking a new policy to ensure these opportunities. Stimulated by governments, or mainly guided by governments, mandatory evolution has a top-down characteristic. Compared with the more induced policy evolution process in the eastern regions, the reform and change of policy in the west is more compulsory. The process is encouraged by top-down government motivations, or the intention of imitating the successful experiences of the eastern areas. Because of the more active policy evolution and innovation, the market and the government have a good connection and the role of the government is, in fact, ensuring an effective implementation of marketization. However, the policy evolution in the western

region is mainly sponsored by the government, with the priority being merely to "solve some urgent economic and social problems, such as the huge employment pressure, economic plight and the leaded serious social and political pressure" (Deng, 2001).

Furthermore, the policies made for west and east are located at the different levels of policy making. West policy systems consist of core polices and there is a lack of other matching systems, while the eastern areas have mutual policy systems, including both core and supplemental polices. For example, in the rural economic policy reform, the western areas, in the long period, had only the core policy named "family contracting responsibility", and some supporting policies of the agricultural finance system, agricultural and sideline products purchase and sale system were deleted. In contrast, in the aspect of enterprise system form, the central government introduced the policies for labor system reform and distribution system reform. The policy mentioning the core system - property right system – was not introduced until the 15th National Congress of the CPC. Bao, Liu and Zhou (2007) summarised the promulgation time of the government policies to encourage economic ownership reform and state-owned land use right transfer in the significant western and eastern regions.

Tab.3-4. The central and local government policies in the fields of economic ownership reform and state-owned land use right transfer

	Local government policy of eastern region	The state government policy	Local government policy of eastern region

Development of a variety of ownership economy	1978Wenzhou promulgated "Interim Measures for the Management of private enterprises in Wenzhou City", "Provision on the Development of Joint-stock Cooperative Enterprises" to promote the development of a variety of economic development 1982 Zhejiang Wenling four companies issued "joint enterprise license" 1984 Beijing Tianqiao Department Store became the pilot joint-stock company. Shanghai Feiyue Aduio Ltd. became China's first standardized joint-stock company	1997 the 15th Party Congress put forward that considering "public ownership as the mainstay and the joint development of diversified forms of ownership, is a basic economic system" 2002 the 16th Party Congress clearly put forward to "encourage, support and guide the development of the non-public economy" 2003 the Tenth National People's Congress adopted the "People's Republic of China Amendment to the Constitution" mentioned the state "encourage, support and guide the Non-Public Sectors Of the Economy (NPSOE)"	Qinghai in 2005 to carry out the pilot work according to "the Guiding Opinions on the Implementation of Qinghai Provincial State-owned enterprises Stock and Right Reform Incentive Pilot Work" 2004 Lanzhou, Gansu city state-owned enterprise reform (90% state-owned large and medium-sized enterprises complete the property rights structure joint-stock reform) Shaanxi Province in 2004 formulated " the Working Methods of the NPSOE Reform and the Establishment of the Ltd Companies"
Land use right transfer	1987 Shenzhen first trial the implementation of the paid transfer of the use of state-run land November 1987 Shenzhen, Shanghai, Tianjin, Guangzhou, Xiamen, Fuzhou	1990, the State Council promulgated the "Interim Regulations on the sale and transfer of the use right of state-owned land in cities and towns" 2002 Promulgated in "the Provision of	1992 Sichuan announced the "Implementation Measures for Sale and Transfer of State-owned Land Use Right in Cities and Towns" 1993, Yunnan Province issued

	implement the land use system reform pilot 1988 Shanghai use the tender to sell land use rights 2000 Shenzhen municipal government to establish land transactions market	Tender Auction and Listing Transferring Use Rights of State-owned Land"	"Implementation Measures for Sale and Transfer of State-owned Land Use Right in Cities and Towns"

Resource: Adjusted according to Bao, Liu and Zhou (2007)

In the year of 1978, Zhejiang provinces in the eastern region enacted the policy for encouraging the reform of property rights in the field of Non-Public Sectors Of the Economy (NPSOE)" and developed joint-stock co-operative enterprises. The pilots have also been implemented in Beijing and Shanghai since the early 1980s. The national level policy was not promulgated until the 15th Party Congress in 1997, in which the development of diversified forms of ownership was put forward. However, the local governments in the western region were sluggish in formulating a policy to promote the reform of economic ownership. Qinghai, for example, had its first policy for pilot work of state-owned enterprise reform as late as 2005. In the capital city of Gansu, Lanzhou also had the ownership reforming in 2004. Shaanxi also had the guidance of working methods of the NPSOE reform and the establishment of the limited companies in 2004. The same situation can also be seen from the policy of land use right transfer. The earliest policy on land use transfer was implemented in Shenzhen, and then some other eastern areas, such

as Tianjin and Guangdong, in the year 1987, but not until five years later did the Sichuan provinces and Yunnan provinces have their own policy for the implementation of sale and transfer of state-owned land use right. In the year of 1988, Shanghai used a tender to sell land use rights. The state government enacted a policy for listing land tender auction in 2002, but relative policies in the western region were promulgated much later (for example, Ningxia and Inner Mongolia in 2003; Gansu and Yunnan, 2007). The eastern region has a much earlier implementation time, more innovations and initiatives of policy than the state and western regions. Most of the policies of the western region were negative responses to the national policy and requirement.

3.2.2 Public administration and governance

The management of public affairs and to encourage the citizens to integrate into the decision making process, transfer the right of the government to the government and protect the right of people to participate in state affairs are the significant parts of public administration construction. The author summaries four aspects of policies in the western and eastern regions, covering: the policy of E-government, opening of government affairs, NGO (using the industrial association as an example) and government performance management and construction. The research mainly depends on data selection from the Chinese laws and regulationsretrieval system from the website :

http://law.jschina.com.cn/law/home/begin1.cbs.

1) The policy of E-government and open government affair

E-Government means using information technology to implement administration. It is a modern administrative management model, in which government agencies achieve the digitization and network of daily official business, information communication and public affairs management by using computer, network communication and other information technology (Peng, 2003). In the year of 1997, Hainan provincial government put forward a strategy to build Hainan as the "Information intelligence Inland" and spent three billion Yuan on information construction in the following year and this was the first strategic plan relative to e-government construction (Bao, Liu and Zhou, 2007). During 1997-1998, five provinces in the eastern areas, named Beijing, Hainan, Tianjin, Hebei and Shandong, established the government website by using the realm name www.gov.cn, which was the earliest practice of government official website construction. In 1998 Qingdao city in Shandong established the first proper government website on the Internet "Qingdao Government Information Public Website" (Wang, 2009). It was not until 1999 that the government authorities officially launched the government Internet project, marking the beginning of China's government information technology entering the Internet era. In 2000, the State Council issued the "Notice on Further Promoting the National Government Office Automation System Construction and Application" and put forward the plan to construct an official business network, administrative business resources

network andpublic information network and to build a shared government information resources database (three networks and one databases). The National Informatization Leading Group published “Guiding Opinions on the Construction of E-government in China” in 2002, to make a new requirement of the development principle, main objectives, tasks, the division of responsibilities and the corresponding policy measures of E-government. However, the earliest local government requirement in western China started at 2001, when Shaanxi Provinces published its E-government Projects Development Plan for 2001 - 2005”. In 2006, Pinging city became the first and only electronic government building pilot city in Gansu. That partly explains why, according to the “2015 Survey Report on the Development Level of China's Urban E-government”, among 36 main cities in China, the ten cities of Beijing, Shanghai, Guangzhou, Shenzhen, Xiamen, Hangzhou, Fuzhou, Wuhan and Nanchang were ranked at the top (Yang, 2016). Eight of them are located in the eastern region, two cities are located on the central areas and none of them are located in the western region.

The same as the implementation of e-government, the policy relative to government affairs opening was firstly enacted in some provinces in the eastern region and then formulated at national level. The provinces in the western region responded and followed the requirement of the state and further made their local policy. In 1997 Hebei province enacted “the Decision of Implementation of Opening Government Affairs”, which was the first local government requirement on opening government affairs. Two years later, Beijing and Guangzhou

promulgated the “Opinions on the Implementation of the Public Affairs of the Township Government”. At the national level, “the Notice on the Full Implementation of the System of Government Affairs Opening in the State” was promulgated by the general office of the CPC Central Committee and the general office of the State Council in February, 2001, two years later than it was implemented in Guangdong and Beijing. In the western region, in 2001 and 2002, some provinces successively implemented the policy on implementation of public affairs opening. For example, in April 2001, June 2001 and 2002, Inner Mongolia Autonomous Region, Sichuan provinces and Gansu Province published the “Stimulate Township Implementation Approach of Opening Public Affirm”, “Provincial Government Advices on The Implementation of Township and above Government Public Affairs Opening” and “Advices on The Implementation of Township and above Government Public Affairs Opening”, respectively. Lijiang city government published the first policy in Yunnan province to regulate the implementation of public affairs opening, called “Advices on The Implementation of Township and above Government Public Affairs Opening” as late as 2005.

2) Public participation

The continual development of social organizations and public participation are the inevitable result of the transformation of government functionsand embodiment of the government's power to return to society. In the year of 1998, the State Council Promulgated “Regulations on the registration and administration of social organizations” and cleared up and reorganized the NGO. There were 165,000

NGOs in China then and this number increased to 662,000 in the end of 2015, according to the Ministry of Civil Affairs Statistical Bulletin for the Development of Social Services. The development of NGO was also unbalanced between the eastern and western regions. Taking the Trade association as an example, before the promulgation of national level registration and administration regulations, in 1986, Zhejiang promulgated the "Notice on Release Interim Provision on Committing Industry Association to Exercise Part of the Industry Management Authority". In 1993, the Lucheng District Smoking Set Association in Wenzhou City, Zhejiang province became the only government authorized association for industry management. In 1997 Wenzhou, Shanghai, Guangzhou and Xiamen became the four Industrial association pilot cities. In 1999, Shenzhen had the first Trade Association Regulations of the Shenzhen Special Economic Zone, while the first formal regulation of trade association management in the western region was made by Xinjiang government in 2010. Before the State Council promulgated the implementation opinions on "promoting the development of trade association" in 2007, the local governments of Fujian, Tianjing and Shanghai provinces enacted "Guiding opinions of the people's Government on promoting the reform and development of trade association". But in the western region, the first local government policy was Shaanxi local government's "the implementation opinions of promoting the development of trade association" published in 2003. Then, Qinghai in 2004, Yunnan in 2006 and Tibet, Chongqing and Ningxia in 2008 consecutively promulgated the policy of promoting the development of trade

association. In addition, the distribution of NGO was uneven in the western and eastern regions. Shandong had the largest number of NGOs in China and the number was 49531, while Tibet had the smallest number of NGOs (only 306) in 2009 (Ye, 2010). However, some people also argued that, in some interior areas, especially the regions inhabited by ethnic groups, there were large numbers of International NGOs. For example, there were more than 200 International NGOs in Yunnan province, which had the largest number of International NGOs in China (Wu and Yang, 2008) and these organizations' main tasks included ecological protection, medical and health, anti drug publicity, poverty relief, etc. (Li and Guo, 2011).

3) Government performance management

Government performance democratic appraisement and administrative efficiency monitoring are indispensible processes to achieve political democracy and improve the effectiveness of administration. As early as 1991, Shenzhen government took the lead in the implementation of administrative efficiency monitoring and in 1999 Zhuhai, Guangdong carried out the "million people review the government" activities and formulated the "Zhuhai model". In 2003, on the third Plenary Session of the 16th CPC Central Committee, Hu Jintao mentioned that they "should educate cadres to establish a correct view of achievements, including the correct view of achievements, and scientific measure of performance". In 2004, Gansu province pioneered China's third party government performance appraisal and formed the "Gansu mode" and this was the first government

performance management method in the western regions.

Tab.3-5 The summary of significant policies onpublic administration and governance in regions

	Local government policy of eastern region	The state government policy	Local government policy of eastern region
[illegible]	1997 Hainan government "Information intelligence Inland" Strategy" 1998 Qingdao, Shandong the first proper government website "Qingdao Government Information Public Website" 1997 and 1998 Beijing, Hainan, Tianjin, Hebei, Shandong has establish the government website by using www.gov.cn.	1999 government authorities officially launched the government Internet project marks the Internet era of government information technology. 2000 "Notice on Further Promoting the National Government Office Automation System Construction and Application" put forward the plan to construct "three networks and one database" 2002 "Guiding Opinions on the Construction of E-government in China" make clearly and requirements and guide of e-government	2001 Shaanxi "Notice on Printing and Distributing the Outline of the E-government Projects Development Plan for the 2001 - 2005" 2006 Pingliang city became the only electronic government building pilot city in Gansu

	1997 Hebei province "the Decision of Implementation of Opening Government Affairs" is the first local government requirement 1999 Beijing and Guangdong promulgated the "Opinions on the Implementation of the Public Affairs of the Township Government" 2002, Guangzhou Government promulgated the "Governmental Information Opening Provisions of Guangzhou". First provision of open government affairs 2004, Shanghai "Governmental Information Opening Provisions of Shanghai City" clearly list the scope of government information should be voluntarily disclosed, a major decision must be disclosed, the scope of government information that free from open and illustrate of the citizen's right to ask for information.	2001 " the Notice on the Full Implementation of the System of Government Affairs Opening in the State" 2007, the State Council issued " the People's Republic of China Government Information Disclosure Regulations and regulated the scope, procedures, time of information disclosure and the ways of applying remedies	2001 April, Inner Mongolia Autonomous Region "Stimulate Township Implementation Approach of Opening Public Affirm" 2001 and 2002, Sichuan and Gansu "Provincial Government Advices on The Implementation of Township and above Government Public Affairs Opening" 2005 Lijiang, Yunan, "Advices on The Implementation of Township and above Government Public Affairs Opening"

NGO Development and Trade Association	1986, Zhejiang promulgated the "Notice on Release Interim Provision on Committing Industry Association toExercise Part of the Industry Management Authority" 1993 Lucheng District smoking set association, Zhejiang became the only government authorized association for the industry management 1997 Wenzhou, Shanghai, Guangzhou, Xiamen association Industrial association pilot areas 1999 Trade Association Regulations of the Shenzhen Special Economic Zone 2002 Fujian, Tianjing and Shanghai "Guiding opinions of the people's Government on promoting the reform and development of trade association	1998 the State Council Promulgated "Regulations on the registration and administration of NGO" 2007 the State Council promulgated "the implementation opinions on promote the development of trade association"	2003 Shaanxi "the implementation opinions of promoting the development of trade association" Qinghai in 2004, Yunnan in 2006, 2008 Tibet, Chongqing and Ningxia, "the implementation opinions of promoting the development of trade association" 2010 Xinjiang government promulgated the "Management measures of the Trade Association"

	1991 Shenzhen government took the lead in the implementation of administrative efficiency monitoring 1994 years of Yantai, Shandong Province, City Project Construction Committee trial implement social service commitment system 1999 Zhuhai, Guangzhong carried out the "million people review the government" activities and formulate the “Zhuhai model”	2003 On the third Plenary Session of the 16th CPC Central Committee Hu Jintao mentioned “should educate cadres to establish a correct view of achievements, including the correct view of achievements, scientific measure of performance" 2005 Premier Wen Jiabao in 2005, "government work report" pointed out: "pay close attention to research and establish a scientific government performance evaluation system 2006 the State Council Office “Guiding Opinions on Further Deepening and Regulating Democratic Appraisement ofGovernment Performance”	2004 Chongqing Interim Measures for the implementation of the Accountability system of the chief executive 2004 Gansu Province, pioneered China's third party government performance appraisal, formed the "Gansu mode"

Resource : Author summary from the Retrieval system of Chinese laws and regulations. http://law.jschina.com.cn/law/home/begin1.cbs

3.2.3 Preferential policy competition and industrial transfer

By increasing more non-agriculture employment opportunities, the industrial transformation drove to economic growth (Yang and Pan, 2014). Industrial transformation is considered as one of the most effective ways to optimize regional productivity space layout, gradually forming a reasonable industrial division

system at the national level and allocation of scarce resources (Luo, 2013). Accordingly, industrial transformation polices means the sum of various policies used to actively intervene in industrial transfer activities made by the central government or local government of the state, in order to promote the growth pole diffusion effect and achieve the goal of regional coordinated development (Zhang, 2011).

The country's “Twelfth Five-year Plan” clearly mentioned that “different regions should give full play to their comparative advantage, promote the co-operation and division of labor among different regions, encourage the rational flow of production factors in the power market and the benign interaction between developed regions and underdeveloped regions, in order to gradually find the best path to narrow the gap in regional development” (Luo, 2013). Some corresponding policies have also been enacted. For example, the construction land-planning index of the state includes the western areas, according to the Ministry of Land and Resources (MLR). Inside the document called “The Great Western Development Land Use Planning Outline”, MLR emphasizes (1) priority arrange and make sure of the key infrastructure construction project on land use (2) implement low land price policy for key development industries (2) implement differentiated land policy (Gao et al., 2013)

1) Cannot avoid the transform of pollution-intensive industries

However, some issues of industrial transformation strategy have to be highlighted. Firstly, the gap existing between western and eastern China in relation

to income and development is similar to the gap between developed and undeveloped countries. The duality in China in economic development makes China face similar issues. “In order to ensure a competitive advantage, the coastal and advanced areas will inevitably put products research, development and sales into local areas, while transferring their products that lack comparative advantage, have a high environmental cost and are located in the relatively low-end of the industrial link to the undeveloped west” (Deng, 2009). To the undeveloped middle and west, those industries are not only labor-intensive industries, but are also pollution-intensive industries. In this sense, following the rules of trade, the high energy consuming industries and polluting industries will gradually shift to the west. “We have to see, since the clean energy still cannot meet the desire of high rapid economic development in China in the short time; the fact is that the demands of traditional energy in the west are increasing and high energy consuming industries shift to the west”(Lin, 2014). Western China has a broader economic development space, abundant resources, relative low labor prices and the cost of the environment. “If the overall pollution cannot be avoided in China, comparing it with the eastern part, the cost of environmental pollution is much lower” (Lin, 2014). Shanghai, for example, achieved thousands of labor intensive and traditional industries transferring to the outside because of the success in applying and holding the World EXPO in the year 2000 (Jiang, 2013).

Based on the national development strategy, for the eastern regions, the most significant work was to improve the standard of economic openness and

marketization and continually transfer from global scale processing, manufacturing and assembling zones to technology research and development, advanced manufacturing and modern service industry zones. While, on the other hand, the undeveloped areas, especially the western areas, had to use their relative advantages on resources and labor resources and undertake the industrial transformation from the eastern regions and developed areas of the global. According to the statistics, currently, the industrial transfer from the eastern regions to the western regions still inherit the basic characteristics of the international industrial transfer that is “dominated by secondary industry and have the trend of third industry” (Jiang, 2013). Even though there were almost 20 industrial transfers from the eastern to the western areas, there slowly appeared some high-tech industries, such as the electronic industry and circular economy industry. Industrial transfer is still dominated by machinery, toys, instruments and plastic and food industries and traditional manufacturing (Jiang, 2013). As claimed by Kang (2002), the environmental problems in the west, in addition to natural factors, are the irrational human factors, which are more important. Wei and Bi (2011) researched the data of the manufacturing industries of the National Economical Industry Classification from 1998 and found most of them had been transferred from the eastern to the western regions from 2004. The 19 industries that had significant industrial transformation are shown in the following table. Nine industries are heavy pollution industries and ten industries are relatively mild pollution industries.

Tab.3-6. The classification of 19 transferred industries, according to the density of pollution

Heavy-pollution industries	Light-pollution industry
Agricultural and sideline food processing industry	Textile clothing and footwear industry
Food manufacturing industry	Leather fur feather and its products industry
Beverage manufacturing industry	Furniture manufacturing industry
Textile industry	Printing and recording media reproduction
Wood processing and bamboo, rattan, palm grass products industry	Stationery and sporting goods manufacturing industry
Paper and paper products industry	Rubber products industry
Pharmaceutical manufacturing industry	Plastic products industry
Non-metallic mineral products industry	Metal products industry
Non-ferrous metal smelting and rolling processing industry	Special equipment manufacturing industry
	Electrical machinery and equipment manufacturing industry

Resource: Wei and Bi (2011)

Environmental pollution transfer has been happening in China in recent years (Cui, 2015). According to international experiences, the success of environmental management in developed countries is always at the expense of increasing the pollution of the developing countries, thus carrying out pollution transfer through trade and capital investment. Similarly, it is possible that the undeveloped west and middle region pay for the environmental management of the east. The east may transfer their intensely polluting enterprises through trade and capital investment. Therefore, the trend of more pollution in the west and middle region seems inevitable.

Recently, the middle region of China has become a national important economic growth plate and has undertaken industrial transfer from the east (Li and Xu, 2013).

However, with the rapid growth of the economy, a series of environmental problems, such as air pollution, has emerged. According to the 2011 China's urban air index ranking, the cities in the middle region rank at the top among the 120 cities, in accordance with the degree of pollution from heavy to light, and most of them rank between ten to twenty-eight (Li and Xu, 2013). Even though the government has adopted some more stringent environmental protection measures, the total amount of the emissions of many pollutants is still continuing to increase with the economic development (Xie, 2010). For example, although prior to the implementation of the China Western Development strategy, the State Environmental Protection Administration (NEPA) and the State Economic and Trade Commission (SETC) jointly issued a document to forbid the polluting enterprises to transfer to the western region by taking the opportunity of this strategy. However, research performed in Inner Mongolia indicated that, in Wuhai city, Alashan and Ordos City, some enterprises with serious pollution came into the western part and settled in succession (Jiang and Zhou, 2003).

2) Competition preferential policy and national strategy

Secondly, the local policies have increasingly been receiving the attention of local governments. In order to develop their economy and accept more industries from the developed areas, the undeveloped regions face fierce competition.Almost all provinces (municipalities andautonomous region) in the western and central regions focused on undertaking industrial transformation as the key strategy in promoting industrialization and urbanization in their regional “Twelfth Five-year

Plan". Until the end of June, 2013, ten national demonstration areas for undertaking industrial transfer, named Anhui Wanjiang City Belt, Yangtze River watershed in Chongqing, Guidong in Guangxi, Southern Hunan, Jingzhou in Hubei, Yellow River Golden Triangle (Shanxi, Shaanxi and Henan), Lanbai Economic Zone in Gansu, Guang'an in Sichuan, Southern Jiangxi and Yinchuan-Shizuishan region in Ningxia, had been approved. Six of them are located in the western areas and occupy 167.7 thousand km2, involving 17 cities, towns and districts, and some national level demonstration zones are still in declaration (Yang and Pan, 2014). Until 2013, there were 208 relative special zones, including national level industrial transfer demonstration zones, technological development zones, high-tech industrial development zones, export processing zones and processing trade gradient shift undertaking areas (Yang and Pan), and cities, towns and districts also had their own development zones. Various western provinces competitively undertook limited industrial transfer from the east and the completion was high.

The local government and administrative department blindly attracted investment and finance from the outside and improved achievements in the government leaders' official careers by using the preferential policy, in terms of land prices and tax. Thus, in order to pursue an economic growth speed and a number of investment and employment targets, the less developed areas compete with each other in introducing preferential policies with super national treatment, in aiming to attract the transfer of industries from the developed coastal areas (Deng, 2009). These super national treatment policies tend to overlook the prevention of

environmental pollution and, hence, create more serious environmental problems and cause a serious loss of the overall interests (Xie, 2016). The taxpayers also change their trade forms and devote to the meditation of obtaining tax preferential treatment (Xiong, 2014). These issues become more serious in some areas when the local governments are guilty of administrative misconduct and create some hard targets in the activity of inviting investment (Xie, 2010). Even though, in the Third Plenary Session of the 18th CPC Central Committee, the tax preference policies were regulated and cleaned up, the current policy of industry transfer mainly focuses on promoting industrial transfer. Strategic policy support systems for the further development of enterprises, such as the science and technology support system, regional talent support system, financing support system and information and intermediary system are absent (Zhang, 2011). In some western areas, the industrial transfer policies pay too much attention to introducing capital without sufficient consideration of enterprise cultivation policy supply. Thus, they also provide a preferential policy for funds and lack the policy supply of other support.

3.3 The influence of duality on policy implementation

3.3.1 The conception of policy implementation

"One of the earliest topics addressed by policy analysts was public policy implementation" (Deleon and Deleon, 2002). As mentioned by Sinkule and Ortolano, (1995) , in practice the implementation of policies is not as simple as

imagined and faces various kinds of uncertainty. The outcomes “are unrelated to initial goals that occur later than planned and cost more than anticipated”. “Implementation problems occur when the desired result on the target beneficiaries is not achieved” (Makinde, 2015). The policy implementation research started with Harold Lesswall, who argued that policy implementation is an indispensable step of the policy process (1956). Along with the failure, or the less effectiveness of public administration policies in the western countries in the 1960s, such as the Great Society policy in the US, the issues of “penetration crisis” and the “implementation gap”, or “implementation deficit”, in policy implementation have received increasing attention. The increase of policy implementation study was “relatively dormant from the time of Lasswell's first suggestion in the 1950s until the early 1970s” (Deleon and Deleon, 2002). This was marked by the publication of the book named “Implementation” by Presman and Widavsky in 1973. Although the case study of the research was the Auckland plan, they found the plan had not been implemented in the way expected by the decision makers, in relation to the main result from the policy implementation. They learned from the failure of this case to emphasize the importance of policy implementation and, in order to change policy science from the theory of science to a science of action, it is necessary to set up a bridge between policy formulation and policy implementation. In this period the policy implementation research “was later to be called the first generation of implementation studies” (Deleon and Deleon, 2002).

During the 1960s, public policy researchers mainly focused on research of

policy making. Prior to 1970, policy researchers were mainly, and merely, wrapped up in the optimization of the policy formulation model and paid little attention to the implementation of the policy. Even Yehezkel Dror, who made great contribution to the public policy, also believed that the fundamental problem of public policy was to improve the system of policy formulation (Wang, 2004). The implementation studies are the missing link for policy intentions successfully transforming to policies, according to Erwin Hargrove (1975) and "too little attention has been paid to the question of policy implementation" (Pressman and Wildavsky, 1973). The first generation study of implementation focused on the "immense vale of troubles that lay between the definition of a policy and its execution" (Deleon and Deleon, 2002).

The first kinds of definition considered policy implementation as a process (Wang, 2004). For example, Pressman and Wildavsky (1973) defined policy implementation as the process of interaction between the establishment of the target and the action to achieve these goals. Edwards (1980) defined it as the whole stages of policy making from the policy made and established in the various kinds of form, such as legislation and regulations, to the consequences for the people who have been influenced by the policies. Mazmanian and Sabatier (1983) defined policy implementation as follows:

> *Implementation is carrying out a basic policy decision, usually incorporated in a basic policy decision, usually incorporated in a statute but which can also take from of important executive orders or court decisions. Ideally that decision identifies the problem to be addressed*

> *stipulates the objective to be pursued and in variety of ways, "structures" the implementation process. The process normally runs through a number of stages beginning with passage of the basic statute, followed by the policy outputs of the implementing agencies, the compliance of target groups with those decisions, the actual impacts of agency decisions and finally, important revisions in the basic statute,*

And "attempt to the capture the full range of implementation activities" (Deleon and Deleon, 2002). O' Toole (2000) tracked Ferman's (1990) ideas and defined policy implementation as "what develops between the establishment of an apparent intention on the part of government to do something, or to stop doing something, and the ultimate impact in the world of action."

Other kinds of definition explain policy implementation as actions or behaviors. For instance, Jones (1977) described policy implementation as various kinds of activities to implement the policies. Among those activities was explaining the contents of the policy to more acceptable instruction, organizing and creating executive agencies, formulating the implementation of the methods to realize the policy goal and applying (which refers to implementing agencies that provide guide services and equipment and pay for the costs) are most important actions. Horn and Weter (1975) claimed that "policy implementation encompasses those actions by public and private individuals (or groups) that are directed at the achievement of objectives set forth in prior policy decisions" and it includes both "one-time" effort to transfer policies into operational implementation and the continuing effect to achieve the policy consequences (large or small changes). Montjoy and O'Toole (1979) mentioned that "We shall refer to decisions made in carrying out a policy as

implementation and the effect on the ultimate target as the impact", which is very similar to Ferman (1990), who defines policy implementation as what happens between the decision makers' intentions and the public policy outcomes.

3.3.2 The policy implementation and duality

Policy implementation cannot be achieved without certain political, economic and social circumstances. Thus the political, economic and social circumstances of a region deeply influence the implementation of the policy and reasons why a certain policy can be successful or fail in a certain place can exist in the political, economic and social environment of the region. The unbalanced social and economic development level could lead to a different implementation process and policy outcomes. The studies of policy transfer, or the "movement of policy and practice from one context to another" (Stone, 2001), have found that, when a successful policy in one company or region is transferred and implemented in other companies and regions, it may become a failure, due to the various kinds of differences in these regions or companies. The structural constraints (Stone, 2001) dominate policy ideology (Robertson, 1991) and other elements, such as bureaucratic size and effectiveness (Rose, 1993), the technological abilities of two different regions and costs of policy implementation (Stone, 2001), could lead to this kind of failure.

Others focus on comparison study of the implementation of the same policy in different regions, such as countries with various kinds of institutional and political

environment or in different political levels, such as various levels of government. For example, Breukers and Wolsink (2007) defined “institution” as the norms and regulations of a government organization, or “behaviors that are generally accepted by members of a social group”, and compared the institutional landscapes of the implementation of wind power in the Netherlands England, and the German state of North Rhine Westphalia. They found local social acceptance, without sufficient recognition of the significance of the policy of policy makers and project developers.

The classification of developed countries, or developing counties, is the summary of the economic, social and political developments. Thus, many researchers have emphasized that the result of policy implementation is different in developed and undeveloped regions, which is a good example of the influence of duality on policy implementation. Generally, developing countries face more serious problems in terms of policy implementation than developed countries. For example, Makinde (2015) identified the issues of policy implementation in developing countries, especially focusing on the Nigerian Better Life Programme and Family Support Programme policies, and argued that, most of the time, policies were implemented in developing nations “without achieving the desired result”. Huang and Palvia (2001) evaluated the implementation of Enterprise Resource Planning (ERP) in developed countries and developing countries with the framework containing economic growth, infrastructure, IT maturity, computer culture, business size, business process reengineering,manufacturing

strengths,government regulations, management commitment and regional environment and found the implementation of EPR in developing countries was facing “additional challenges related to economic, cultural, and basic infrastructure issues”. “It has been observed that policy implementation is one of the major problems confronting developing nations” Makinde (2015). This mainly results from monetary constraints, lack of reliable technology, human resources, sense of environmental awareness (Swanson, K.E., 1999) and “corruption, lack of continuity in government policies, inadequate material resources”(Makinde, 2015). Chen et al. (2006) summarized the differences between developed and developing countries, including history and culture, technical staff, infrastructure, citizens and government officers, and then used the US and China as case studies, researching the influences of these differences on E-government implementation processes and the outcome of E-government strategies. The reasons for the failure of certain policies through the case studies and the gap between the different implementation outcomes of policies can be summarised in the following aspects : the different government structures

Tab.3-7. Main difference between the eastern and western regions in policy implementation

		Eastern region	Western region
Implementation subject	Government officers’ ideology	Has the basic knowledge about the aims, principles and outcomes of the policy; Has the clear idea and experiences about	Bureaucratic and conservative views of policy innovation and passive accept the conception of policy; Lacking new

		implementation process Willing to facing changes and open views of policy innovation	knowledge of management experience and distortive and misunderstand the aims and outcomes of policy Short-sighted, adhere to old habits and follow a stereotype routine;
	Motivation and benefits balance	Easy to coordinate with national interests with local interest; Sometimes cannot avoid to focus on the department and regional benefits Under the Supervision of benefits distribution, to some extend help decrease self-interest while the large amount of funds and resources stimulate uneven distribution and corruptions Has the motivation to implement policy and actively encourage the implementation	The social benefits of the policy sometimes has strong coordination with local benefits others are opposite especially in the field of economic benefits ; Economic benefits of the region lead to hesitate to implement the policy especially the policy relative to environmental protection and resources exploration No strong motivation and passive reaction
	Personal policy	High requirements on civil servant exam Provide western staffs with experiences and knowledge by training Feasible stimulation	Lower requirement on civil servant exam. Need the help from west in job training. Unreasonable stimulating policies

		policies.	such as long working contract The leadership and "guanxi"
Government structure	Vertical organization	Fast and efficient information transfer in various levels The discretionary power of higher-level sector cannot avoid Corruption and too much intervene from high-level and "important " agencies (for example, the Department of Finance)	Fast and efficient information transfer in various levels Strong sense of bureaucracy of higher level of department The discretionary power of higher-level sector without considering the voices from lower level Corruption and intervene from local government and high-level agencies
	Government departments at same level	Relative effective negotiation with more transparent process Relative clear responsibility distribution Less benefits competition and implementation difficult on "black" standards	Less efficient negotiation and cooperation and set aside negotiation result Obviously responsibility circumvent and benefits competition "Black" standard and "black" implementation
	Information transfer	Information easily transfers within same origination at different level instead of crossing the different organization at same level.	

		The policy implementation is blocked because of the information loss at bottom.	
Ability	Technical Staff	Has the certain number of well-educated people Encourage to stimulate more; Has relative fair promotion opportunity, financial resources, train opportunities	Does not has sufficient staffs Does not satisfied with working experiences Lack of further training opportunities and restricted to limited knowledge, skills and methods.
	Technology and infrastructure	Has sufficient hard and soft technology support and infrastructure Connection and share information with research institutions and colleges	Without sufficient software and hardware equipment (for example, the equipment of quality inspection, data analysis and positioning) The lower usage rate and the lack of in time repair and update of infrastructure
	Data	Has some reliable history data Less mistakes and less consistent data Current formal data collection and data statistics requirements and methods More open data for researcher and general public	No reliable history data, some false and mistake data Current immature data collection methods especially in town and country level monitoring stations No in time, limited range and less systematic information open

	Financial support	Sufficient local financial resource to support the policy implementation; Could cover the cost of public participation and policy innovation An increasing number of local finance invested to implementation of energy , resources, environmental, technology and science policy	Insufficient local finance and require central government financial support Local finance first invest into infrastructure construction and fixed assets, change the living condition of rural residents Public participation is considered as high cost
Supervision	Government department supervision and misbehavior penalty	Appendage of government and focus on the government benefits at a whole	
	Citizens	Relative more experiences on supervision; Willing to integrated in decision-making process Basic knowledge and skills of supervising process, legal rights and legal assistance Either have confidence or have crisis of confidence with democracy process	Less experiences on supervision, adhere to old habits and official standard thought Insufficient knowledge and skills of supervising process, legal rights and legal assistance Blind trust government decision or crisis of confidence of government

Resource: Author drawn from Cui (2015), Luo (2012), Xie (2016), Li (2007) and Xu (2014) , reconstructed

1) Implementation subject

a) Government officers' ideology

Restricted to overall social development standards, the overall quality and education level of government officials in the western region is lower than in the eastern region. Lacking new knowledge of management and a comprehensive understanding of aims, principles and outcomes of the policy, government officials in the western region are more likely to face difficulties in the effectiveness of arranging the propaganda and guidance work of policy implementation, and find it harder to make the implementation methods co-ordinate with the various kind of relations and resources needed by policy implementation, which leads to distortion, misconduct and error during the policy advocacy and execution. In addition, restricted to less creative and open and more traditional and conservative economic, social and political circumstances, some government officers in the western area are short-sighted, adhere to old habits and follow a stereotype routine. They may misunderstand the principles and aims of certain policies, or may be unwilling to follow the requirements of the policy and lack the sense of democratic decision-making. On the contrary, government leaders in the eastern region generally have more experience and knowledge in management. "Central government and eastern areas require their official leaders to have grassroots work experience and working experiences in the western region"(), thus helping them to collect experiences about policy implementation. The open and active social circumstances and advanced social development standards also result in a relatively active political environmental. The policy implementers are willing to face changes and are open

to views of policy innovation.

b) Motivation and benefits balance

Policy implementers, on one hand, should be representatives of the state and pay attention to increasing the overall social benefits from the view of the whole country. On the other hand, they cannot avoid considering the benefits of the region and departments, and even the self-interest, when recognizing and executing policies. “The aim of public administration is redistribution of social interest and resources. The results of the implementation of a policy will always cause some people to get benefits while other people’s benefits will be impaired” (Song, 2006). Currently in China there exist different social groups and interest groups. Sometimes these groups can be mutually influenced and mutually promoted, while sometimes having competition and conflicts. It is difficult to take into account the interests of all parties, classes, groups, regions and individual interests. Even though balancing the benefits of various aspects cannot be avoided in both western and eastern regions, a better supervision mechanism and more transparent government information and processes should decrease the corruption and self-interest in the eastern region. However, the provinces in the eastern regions with high economic development levels usually have the largest amount of funds and resources, which stimulates government officials to wrongfully implement policies and breed corruption. For example, according to the administration misconduct and corruptions government officials’ names public list shown on the Central Discipline Inspection Commission website (http://www.ccdi.gov.cn), even though some

provinces in the western region have a higher ratio of officials having misconduct behaviors or corruption and higher number of government officials (such as the number of Qinghai provinces is 0.03% and is the highest rate of the whole country), from January to 15th September this year, 155 officials in Shandong provinces were notified because of misconduct or corruptions. Shandong then became the province with the largest amount of misconduct or corruption events, followed by Liaoning (127 officials), which is full of raw materials, such as mineral resources, and is also located in the eastern region. In addition, as has been discussed above, the east areas have more bottom-up practices on policy-making and active motivation in policy innovation. Thus, in the eastern region, the local interests are easier to co-ordinate with national interests, although, sometimes, conflicts appear among agencies and government leaders' self-interests. In the west region the social benefits of the policies sometimes have strong co-ordination with local benefits in the fields of financial support, infrastructure construction and universal education, while, sometimes, the policies are opposite to the views of the government leader in increasing local benefits, especially the economic benefits. Thus, the government leaders hesitate to implement policies without specific economic benefits, such as environmental protection and resources exploration restriction. In addition, most policies making and implementing start from the eastern pilot and are then finally enacted by the central government, and then top-down implemented in the western region, which leads to the eastern government having the motivation to implement the policy and actively encourage the implementation. The governments in the

western region have just passive reactions, without strong motivations.

c) Personnel Policy

Personnel policy is affected and limited by multiple factors, such as domestic politics and laws, the leadership of the managers, the function of management, the staff quality and structure, the cultural traditions and history of agencies (Tan, 1998). In the eastern and western parts of China, under the same national politics, laws and regime, the differences of personnel are affected by the staffs' quality and the bureaucracy.

In term of employees' quality, the personnel policy mainly derives from two aspects personnel selection and promotion of position. The former means to find people who meet the requirements of the job, and promotion means through performance evaluation and competition to find staff with higher capacity and high efficiency. A handful of scholars suggested that the region would cause differences in the personnel policy in person selection and promotions of position. Han (2005) suggested that, to make every policy, especially preferential policy, the government and related departments had to invest labor and financial resources, and for the less developed areas that have a weak economic foundation and financial constraints it is more difficult and has more resistance. Peng (2016) argued that the central government issues some employment subsidy policies to encourage university graduates to work in social management and public service agencies in rural or western areas, and one typical policy is exemption, or partial exemption, of students' loans during the university period. These policies would guide the

direction of graduates in personnel selection. Traditional personnel selection and promotion criteria include education background, professional skills, experiences, contributions, behavior norms, interpersonal relationships, etc. Among them, examination is the basic personnel policy in China (Baike, 2016). During these processes, the policies' differences between the western and southern parts could be reflected in the following aspect.

For the provinces located in the western part, since there are particularly poor areas where the education quality is low, the policies also consider this situation when making the eligibility regulations. Taking Guizhou as a case, the minimum academic requirements for the 2016 civil servant exam is a three-years college degree or above, and for the candidates born in particularly remote rural areas, the minimum requirements can be lowered to high school or technical secondary school. In comparison , the academic requirement of the 2016 civil servant exam in Shanghai is a four-year college degree or above, and in special cases the minimum requirement can be lowered to a three-year college degree. For non-local students, the degree required is a Master's or above. This kind of difference means that the talents in the western and eastern parts in China are different.

Starting from 2000, according to the plan and arrangement of the National Personnel Department, nine provinces in the eastern part were asked to exert the advantages of education and talents and help the eleven provinces in the western part in relevant job training. The targets of this policy were to train civil servants in

important positions and help them to improve their administrative capacity and skills to deal with problems in the market economy. One person in charge of this policy suggested that, if the government still did not address the lack of talent resources in the western area, the development in the western part would face big barriers (Zhou, 2005).

The stimulation polices in the western parts of China are unreasonable and could be reflected in two aspects. Firstly, the working contract is too long. Regions in the less developed areas always focus on the talents working in the same agency through long-period working contracts. This situation in the western parts with a low development level is very serious. For example, in Qianjiang Bureau of Environment, the working contract could be 10 years for an individual in the same position. This hinders the positive regeneration of talents and also makes the people with a high quality reject these job opportunities. Secondly, with the traditional ideas, the job promotions are always given to older people and this leads to young people working without enthusiasm and initiative.

On the other hand, the personnel policies can guide the flow of personnel sources, but the executors, and whether they can correctly execute the policies, will control the outcomes, to some extent (Baike, 2016). Guanxi, as a kind of traditional culture context in China, is imperative in policy implementation. As Jacobs (1979) suggested, “Chinese, when seeking political allies, will prefer to ally with persons sharing a guanxi base”. To support this, Zheng (2003) suggested that, compared with the eastern part, the leader in the western part ignores the capacity,

professional skills and education background of employees and only wants them to obey commands and gives job opportunities and promotion to the employees who have guanxi with them.

As well as guanxi, the leadership and capacity of leaders are also different and will lead to different outcomes of policies. In the eastern coastal areas , the new ideas and principles that are suitable for the modern market economy and the domestic and international development trend could quickly be accepted by the local government to create a favorable policy environment. However, the western leaders are accustomed to traditional ideas (Xu, 2003). The western cities lack good heads that have a deep understanding of policies. According to the data analysis, "the amount of professional cadres occupy 64% in southern China, whereas this amount is only 20% in the western area" (Zhou, 2001). Thus, the deviation in execution is inevitably different in the different parts.

2) **Government structure**

It is necessary to describe the government structure of China for further understanding of the issues of policy implementation in the institutional level. There are five hierarchical levels of administrative divisions, as follows:

i. *The State*
ii. *Province (including provinces, municipalities directly under the central government and autonomous regions)*
iii. *City and prefecture-level cities*
iv. *Counties and county-level cities/ districts (only exist in municipality directly under the central government)*
v. *Rural township and neighborhood committees*

There are three state administrative organizations, including: the authority organizations (NPC and the Standing Committee), the executive organizations (the State Council and government) and the judiciary organizations (Court and Procuratorate).

The People's Congress is the highest authority and legislature-provincial. According to the hierarchical administrative division, the People' Congress has four levels, from the state level NPC, provincial level of PC, city and districts level People's Congress and counties to the county-level cities People's Congress. The People's Congress has specific standing committees covering the fields of ethnic affairs, law, finance, education, science, culture and foreign affairs, the overseas Chinese affairs, the House Judiciary, the environment and resources protection, the agriculture and rural affairs, etc.

The governments are also graded from central government to counties and county-level cities/ districts government and townships and neighborhood committees. All the governments in various levels are subject to a State Council that includes a premier, vice premiers, state councilors, ministers, auditor generals and secretary-generals as the power center of the whole country.

The People's Congress exists in every government level as a sign of democracy in China to collect information and advice from people's deputies. In addition, There are 25 ministries led by the State Council, such as the National Development and Reform Commission (NDRC), the Ministry of Education, the Ministry of Science and Technology (MOST), the Ministry of Industry and

Information (MIIT), the Ministry of Finance, the Ministry of Human Resources and Social Security (MHRSS) the Ministry of Land and Resources, Ministry of Environmental Protection (MEP), Ministry of Housing and Urban Rural Development (MOHURD), Ministry of Transport, Ministry of Water Resources, Ministry of Agriculture, Ministry of Commerce, etc. Each ministry has a lower level agency. For example, the MEP has its own lower level administrative department, the Environmental Protection Bureau (EPB) at provincial and urban level and the Environmental Protection Office (EPO) at Counties and county-level cities level.

a) Vertical organization

Over one third of the government institutes and agencies rely on this kind of vertical structure in China (). The function and responsibility of the lower level institutes are copied from their higher level. “Central ministries have their counterparts at the provincial level, which are mirrored in prefecture-level and county-level cities (e.g. a City Finance Bureau consult with relevant Provincial Finance Bureau, which, in turn, communicates with the Ministry of Finance)” (Kamal, Leeman and Rufei, 2009). The government at one level manages the actions of various ranges of departments at the same level through legalizations, policies making and supervision, but cannot command and intervene in the business or professional work of the departments. The department is directly restricted and guided by departments at a higher level. The function and responsibility of department are decided through a negotiated approach. The

negotiation happens between the central government and provincial governments, provincial government and city-level government, city-level government and county-level government (OECD, 2013), but they cannot negotiate bypassing the immediate leadership.

This vertical structure has many advantages, especially in enhancing work efficiency, avoiding local protectionism and protecting the information transfer between the various levels (Dong, 2009; Dong2, 2009; Sun, 2011; Li and Li, 2010). This occurs in both the eastern region and western regions as fast and efficient information transfer in different levels. However, Dong Juan (2009) argued that the high-level government gathers together the right of administrative management, administrative law enforcement and administrative supervision, and the negative effects of vertical structure is that the higher-level sector has too strong a discretionary power that cannot be avoided in the eastern region. This leads to corruption and too much intervention of the higher-level governments and governments play more of a direct important role, or administrative role, from the views of the general society (For example, the Department of Finance is always viewed as more "important" than other government departments, as it has the responsibility of distributing financial resources to other agencies). In the western region, the strong discretionary power also increases the sense of bureaucracy of the higher level departments, who make decisions without fully considering the voices from the lower-level government. The issues and requirements of the bottom-level society are hard to transfer to the decision-making agencies and solve

timely. This structure leads to an information gap between the contiguous levels. Especially under the circumstance of the imperfect legal system in China, vertical structure could increase corruption in the higher-level agencies. In addition, the policies made by the central government may face implementation issues at the local level, because of the different government attention and benefits distribution.

b) Government department at same level

As well as the hierarchical power structure, there is a horizontal structure amongst ministries, agencies and the government at the same level. Different agencies and government departments sometimes have overlapping responsibilities in performing the administrative affairs. Thus, the horizontal structure reflects three important aspects of the relations among government departments: competition , negotiation and co-operation. On the other hand, this horizontal structure also has advantages. The games between horizontal agencies through negotiation and co-operation would avoid high costs, because of avoiding serious mistakes and individual work (Liu, 2007). However, with the lack of legalization, the co-operation and competition among the horizontal agencies evolve into a game of interests and the evasion of responsibility (Fang, 2010). This means the managers in agencies make efforts in the field to maximize benefits, but shirk responsibility in maintenance and management. It is reflected in the eastern region as a relative effective negotiation process, with clear responsibility distribution among the different department and less benefits competition and implementation “black”.

The western region, in contrast, has obvious responsibility circumvent and benefits competition and less efficient negotiation and co-operation among departments. “The consultation result always sets aside the result from the views of the department leader” (). In addition, implementation “black” and standard “black” are not unusual in the western region.

c) Information transfer

With the vertical and horizontal government structure, information easily transfers within the same organization at different levels, instead of crossing different organizations at the same level. The negotiation among different government agencies at the same level and without a certain relationship of administrative subordination cannot ensure the openness of information across systems and there is not a specific information sharing mechanism. In addition, the policy implementation is blocked, because of the information loss at the bottom. For example, since 1999, the State has carried out national student loans, which is a kind of loan that the state pay for interests, that does not require economic assurance and is issued by state-owned commercial banks to support the tuition fees, accommodation fee and living expenses of students from low income families. Because the national student loan involves a wide range of students and has strong financial support power, the implementation of the study loan has been welcomed by the society and students in poverty. However, annually, many students from poverty families, especially in the remote and poor regions, both in the eastern and western regions, have never heard of this policy and have lost out on the

opportunity to receive high education, unfortunately because of the information transfer from the high level government to the bottom general public involved.

3) Ability

The ability of government organizations in policymaking and implementation deeply influence the effectiveness of policy implementation. The author summarises four kinds of ability relative to policy implementation and the significant gaps between the western and eastern regions, named technical staff, technology infrastructure, data and financial support.

a) Technical Staff

The eastern regions have a certain number of well-educated people who are familiar with the usage of new equipment, software and management models, etc.. In addition, an increasing number of favorable talented people have attracted policies to be made to encourage more stimulation. Relatively fair promotion opportunities and financial resources are provided to technical staff, as well as training opportunities that can further improve the technical and knowledge level of staff. On the contrary, almost all provinces in the western region are facing issues of less sufficient technical staff and a certain number of staff are not satisfied with their working environment The lack of further training opportunities provided by the government can restrict their ability to update their knowledge, skills and methods.

b) Technology and infrastructure

Advanced and sufficient technology and infrastructure are important in many

processes of policy implementation covering data collection, information openness, screening, monitoring, message transfer, and public supervising etc. In general, the eastern region has sufficient hard and soft technology support and infrastructure. Thank to its better higher education resources, the government agencies also connect and share information with local research institutions and colleges, while the western region does not have sufficient software and hardware equipment, such as equipment for quality inspection, data analysis and positioning. In addition, some very expensive infrastructure bought by the local finances can only be used by a certain number of people and the usage rate is very low. In time repair and updates are lacking in this region.

c) Data

Accurate and sufficient data is indispensible in almost every step of policy implementation. It is helpful for enacting on time and correct policies, evaluating the changes in every policy implementation process and monitoring the outcomes of policy implementation. Because of the early social development and technology level, reliable and systematic statistics in government agencies have begun much earlier than in the west. Thus, it has some reliable history data and relatively less mistakes and consistent data. Currently, formal data collection and data statistics requirements and methods have been enacted and accepted. In addition, more data is open for researchers and the general public, while in the western region there is no, or very little, reliable history data and some existing data is false and has mistakes. Data collection methods and requirement standards are still immature,

especially in town and country level monitoring stations for the National level China Statistic Yearbook , Provincial Statistic Yearbook, City Statistic Yearbook and Specific field Statistic Yearbook, such as China City, Statistic Yearbook Statistical yearbook of water resources and with rare provincial level statistics yearbooks. The data openness is restricted to a limited range and lacks systematic information (for example, no consecutive data or gap between the same data from two different resources).

d) Financial support

The financial support received by the local government on policy implementation depends on local financial incomes and the support of central finance. The rich provinces, cities and even towns in the eastern region have sufficient local financial resource to support policy implementation and cover the costs of public participation and policy innovation. Instead of investing in infrastructure construction and fixed assets, an increasing number of local finance has been invested in the implementation of energy , resources, environmental, technology and science policy. The western region, on the other hand, generally, has insufficient local finance. Some provinces, such as Tibet, Gungxi, Gansu, Ningxia and Guizhou, require a large amount of financial support from the central government each year, thus public participation in decision-making is considered a high cost. Local finance also first invests into infrastructure construction and fixed assets, to change the living conditions of rural residents.

4) Supervision

Citizensin the eastern regions have relatively more experience of supervision and the basic knowledge and skills of the supervising process, legal rights and legal assistance and are more willing to integrate in the decision-making process. They hold different attitudes about the democracy process of government decision-making. Some of them have confidence that public participation is gradually integrating into the government decision-making process and becoming the effective way to supervise the administrative actions, or that increasing public supervising could restrict the government misconduct, while others have a crisis of confidence with the democracy process, while the citizens in the western region have less experiences in supervision and insufficient knowledge and skills of the supervising process, legal rights and legal assistance, leading to less supervision from the citizens. In addition, they also find it easy to adhere to old habits, official standard thoughts and blind trust government decisions or do not trust what government says about specific policies.

The media and NGOsin the eastern region are relatively more willing and have freedom to monitor the government behaviors, and there are many critical and influential local medias, such as the *Southern Weekly* in Guangzhou and *Sanlian Life Week* in Beijing. In the western region, however, there is a lack of the influential NGOs and local media to supervise the mistakes in government policy implementation.

However, the policy implementation in the eastern region is not equal among the

different provinces. The South-eastern coastal provinces ofShanghai, Zhejiang, Jiangsu, Guangzhou and Shenzhen have more obvious advantages in policy implementation. The provinces in the western region, in general, have more obstructions in policy implementation and the situation is better in Chongqing, Sichuan and Inner Mongolia.

Chapter four: SEA in China

4.1 History and practices of SEA

In order to promote the task of environmental protection, since the 1970s China has been absorbing the successful experiences of other countries and established environmental impact assessment regulations. In 1973 the first National Conference on Environmental Protection was held in Beijing, when the concept of EIA was first introduced into China. A few years later, in 1977, the China Academy of Sciences hosted the "Regional Environmental Science Seminar" and promoted the environmental quality status assessment of the big cities. On December 31stin the year 1978, the report that the Central Committee of the Communist Party of China (CPC) approved and forwarded to the State Council, "Environmental Protection Working Report Key Points", for the first time mentioned the intention to carry out environmental impact assessment. In April 1979, the State Council Environmental Protection Leading Group, in its "Report on the National Environmental Protection Work Conference", once again put forward the EIA as a government policy. In the same year, with the support of the state government, Beijing Normal University and other units carried out the first construction of an EIA of the Jiangxi Yongping Copper Mine in China. In September 1979, China promulgated the first comprehensive environmental protection law since the founding of the People's Republic of China (PRC), named "The Environmental Protection Law of the PRC (for Trial Implementation)", and

put the EIA regulation into the list of national legal systems (Articles six and seven), which is a symbol of the official establishment of the EIA system and argued as the national primary EIA legislative action. China then became one of the earliest countries to implement environmental impact assessment in the projects' level (Cai, 2009).

In the 1980s, the environmental impact assessment research and practices started to cover the regional level, even though the concept of 'strategic environmental assessment' had not been mention at that time. In 1981, the promulgation of the "Basic Construction Project Environmental Protection Management Measures" provided details of the regulations about the range of EIA, the contents that should be in the assessment and the EIA working and censoring process, and ensured that the EIA system would incorporate a basic construction projects examination and approval process. The government, in 1986, promulgated the "Construction Project Environmental Protection Management Measures", which modified and clearly defined the EIA system. The EIA system in China was then established. These management measures also officially regulate the appraisal of the environmental impacts on regional development. One year later, the concept of "Regional Environmental Impact Assessment (REA)" was first mentioned by experts in the "Handbook of EIA". As a main component of SEA, the introduction of REA played an important role in broadening the range of the EIA in China.

In 1989, pervious SEPA (State Environmental Protection Administration) promulgated "Construction Project EIA Certificate Management Measures (Trial)"

and "The Principles and Methods of EIA Charging Standards Announcement (Trial)", which standardized the requirements of EIA certification management. According to these two documents, the government would be able to efficiently issue the EIA certification, form professional teams and establish the fee charging principles, depending on the workload. The "The Environmental Protection Law of the PRC" was adopted in China on 26th December 1989, with the thirteenth provision and other provisions of this law regulating the EIA system.

NEPA held "the Workshop of Regional Development EIA and project EIA Process and Methods" in Shanghai in 1990. From 1992 to 1994, the Tianjin environmental assessment center and another seven units commenced the first regional level EIA on Tianjin Development Zone Planning. During the National Conference on the Environmental Protection Agency, Qu Geping, in 1992, the first director of NEPA stated that "The environmental protection departments need to actively participate in the national economic comprehensive decision-making process and play the role in promoting the correct handling of the relationship between development and the environment". In the same year, China finished its first environmental appraisal on integrative exploitation of natural resource: Liao River Delta Oil and agriculture resource integrative exploitation environmental impact assessment.

One year later, during the Thirteenth Annual Meeting of International EIA Conference held in June 1993, the director Qu Geping formally mentioned carrying out again the EIA on development strategy and policies. Carrying out the REA of

Development Zone Area was required, according to the government document named “Some Advices on Further Improving the Construction Project EIA Work was issued by a previous NEPA in the same year. Some principles and management processes were also issued and performed. In 1995, pervious NEPA put forward the theory, technology and management method of improving the environmental impact assessment of regional development in the "China Environmental Protection Twenty-first Century Agenda".

The State Council, in 1996, clearly put forward in “The Decision on Several Issues on Environmental Protection" that, when making important decisions relative to economic and social development, such as regional development, urban development, a sector development plan and the arrangement of industrial structure, it should comprehensively consider the economic, social and environmental impact and the environmental impact argument. However , the all-round regional development environmental impact assessment was not mentioned at that time, neither did the appraisal become a compulsive part of the EIA system (Xiao,2010). In the same year, the president Jiang Zeming mentioned in the Fourth National Environmental Protection Conference that economic decisions have a significant influence on the environment and, thus, they should be reached from strategic management and a decision-making mechanism about the environment and development should be established. When making key economic and social development polices, plans and programs related to important resource exploration,

their benefits and costs should be assessed in the view of being combined with development and the environment.

The Research Institute of Environmental Science of Beijing Normal University, in 1997, conducted the SEA of Shaanxi Province development strategy, named “Attaching equal importance to coal and electricity”. On 29th November, 1998, the State Council enacted "The Environmental Protection Management Regulations of Construction Project" and mentioned that, “when producing a regional development plan of river basin development, development zone construction, urban new district construction and urban regeneration, the government should organize an REA. This saw the REA system being first formed by law.

The “People’s Republic of China Air Pollution Prevention and Control Law”, enacted in 2000, allows relative departments to process a comprehensive assessment on its economic feasibility, technique feasibility, guarantee system and social impacts, and became the first law that evaluates the environmental impact in the process of legislation, and this marked the SEA entering a new stage of development. The EIA system expanded to a legislative level. In 2001, the state council ratified the national environmental protection Tenth Five-Year plan and explicitly requested the exploration and development of significant economic and technology policies, development planning and appraisal of environmental impacts on those polices and planning, to make the systemic decision more regulated. SEPA mentioned, in “The Announcement of Strengthening the REA of

Development Areas" in 2002, that the SEA should be in process when producing plans of development areas. On 1st September 2003, the "Law of the People's Republic of China on the Environmental Impact Assessment (Law of PRC on the EIA)" was officially announced through a three times preliminary review (on Dec. 2000, Aug. 2002, Oct. 2002). The objects of the EIA expanded to a plan and program level and the SEA was officially formed.

In the August of the same year, SEPA promulgated the "Planning Environmental Impact Assessment Guidelines (Trial)" HJ/T130-2003, which put the projects EIA, REA and Planning EIA on an equally important position and mentioned the general methods and technologies of planning environmental impact assessment. The "Interim Provisions on the Implementation of EIA Engineer Professional Qualification System" was implemented on 1st April, 2004. In the same year, the former SEPA completed China's first national level industrial planning environmental impact assessment, namely the "National Integration of Forest and PaperConstruction the 10th Five-year Plan and 2010 Special Plan EIA". SEPA issued "the Announcement of the Range of Plans that are required to produce the EIA Report (for Trial Implementation)" and " the Announcement of the Range of Plans that are required to produce the EIA chapter or instruction (for Trial Implementation)" in the July of the same year.

China's first province level SEA-Inner Mongolia Eleventh Five-Year Plan SEA" was reviewed by SEPA in 2006, resulting in the Inner Mongolia government adjusting targets, main projects and the industrial layout relative to the Eleventh

Five-Year Plan. On 22nd June, 2006, in order to promote the work of the SEA, 39 academics and scholars from the fields of economy, society, environment and resourcescomposed the SEPA SEA expert advisory committee. Two months later, China's first urban master plan, the SEA-Wuhan national economic and social development 11th Five-Year Overall Plan Compendium SEA, passed the expert review. In the same year the “Interim Measures for the Public Participation in EIA” was released, which is the first normative document of public participation in the field of environmental protection in China. It is, however, limited to the field of project EIA.

In 2008, SEPA started the Five Regions (The Bohai Sea Coastal Areas, the West Side of the Straits Economic Zone, the Beibu Gulf Economic Zone, Chengdu Chongqing Economic Zone and the Yellow River Middle and Lower Reaches Economic Zone) Key Industrial Development Strategic Environmental Assessment. Those SEAs broke the range (“one land use, three regions, ten special programmes”) of SEA in the legal system and a number of new evaluation methods involving ecosystem health were used. The five regions’ SEAs are China’s first multi-regional, multi industry, high-level and large-scale strategic environmental impact assessments and played an important role in enriching China's strategic environmental impact assessment technology, methods and experiences.

In 2009 the "Planning Environmental Impact Assessment Ordinance" was officially announced and this is used to standardize the procedures, contents, form and report of the SEA in plan and to improve the monitor and tracking process and

other restricted mechanisms. This was great progress for the environment legislation in China and marked the environmental protection engaging in the decision-making process entering into a new stage (Zhang et al., 2010). The regulation clarified the content of PEIA, and detailed the responsibility subject, public participation, implementation process, etc. On 1st October 2009, the Ministry of Environmental Protection published the 'Technical Guidelines for Plan Environmental Impact—general principles (exposure draft), providing the details of the methods and working process.

The Ministry of Environmental Protection (MEP) started the China Western Development key regions and industrial development strategy environmental impact assessment following the experiences of the SEA in the five regions in 2012. Two years later the new "The Environmental Protection Law of the PRC" was issued. Article 14 proposed that the departments of the State Council and the governments of provinces should fully consider the environmental impacts and listen to the voices of experts when making decisions about economic and technology policies. It provides the legal basis for the SEA in the policy level and establishes an ecological friendly decision-making mechanism. In the same year the MEP enacted the "Technical Guidelines for Environmental Impact Assessment of Plan"

Generally speaking, in order to promote the task of environmental protection, since the end of the 1970s China has been absorbing the successful experiences of other countries and established EIA regulations. In mainland China, all new

construction projects have to pass an evaluation with EIA before applying for a permit for construction of land-use planning and it is estimated that 93.6% of the national and local construction projects were evaluated with EIA in 2000 (SEPA 2003). Since the 1980s, practices of SEA in the district, program and policies level have been started (Xiao, 2010),for example, 'Generally SEA of China Western Development Strategy', 'Liaoning Coastal Economic Zone Development SEA', 'Water Conservancy Construction of Yangzi River SEA'. There have been a series of SEA processes relative to the post-disaster reconstruction of Wenchuan after the 2008 8.0 Ms Sichuan Earthquake, including 'The Master Plan of Post-disaster Reconstruction' and 'Specific Plan about Industrial Distribution and Adjustment' and 'Tianjin sewage reuse SEA'.

Although there are many practices of SEA in the district, program and polices level (Xiao, 2010), it was not until August 2009 that the first law that required an assessment impact on the strategic level was enacted. The promulgation of the 'Regulation of Assessment Impact for Planning Environment' was great progress for the environment legislation in China and marked the environmental protection engaging in the decision-making process entering into a new stage (Zhang et al., 2010). However, very few of the plans or policies have been evaluated with SEA (Schmidt and Albrecht, 2006). The gap between the requirement of the law and the number of plans and programs under evaluation is still very broad (Zhang et al., 2010), and the implementation of SEA is still at the beginning level. The lack of theories, methods and practices is still problematic and needs to be solved in the

future. In addition, the Chinese vision of EIA/SEA 'has been strongly influenced by the historical emphasis on pollution prevention and control' (Wang and Morgan, 2003). It is important to evaluate how effective such systems are and the 'instructive on particular issues implicated in the development and implementation of SEA' (Partidário, 2006). The major events of the EIA and SEA in China are described below (Tab.4-1):

Tab.4-1. The major events of EIA and SEA in China

1973	The first National Conference on Environmental Protection held in Beijing, the concept of EIA was first introduced into China
1977	China Academy of Sciences held the "Regional Environmental Science Seminar" and promoted environmental quality status assessment of big cities
1978	The State Council Environmental Protection Leading Group first proposed the intention to start EIA work in its "Environmental Protection Work Report"
1979	The State Council Environmental Protection Leading Group in its document named "Report on the National Environmental Protection Work Conference" put forward the EIA as a government policy once again
	Beijing Normal University and other units carried out the first construction EIA of the Jiangxi Yongping Copper Mine in China
1981	Promulgated the "Basic Construction Project Environmental Protection Management Measures"
1986	Promulgated the "Construction Project Environmental Protection Management Measures". Modified and clearly defined EIA system. The EIA system in China has been established.
1987	The concept of "Regional Environmental Impact Assessment (REA)" was first mentioned by experts in the "Handbook of EIA"
1989	SEPA promulgated "Construction Project EIA Certificate Management Measures (Trial)" and "The Principles and Methods of EIA Charging Standards Announcement (Trial)".
	Adopted the "Environmental Protection Law".
1990	NEPA held "the Workshop of Regional Development EIA and project EIA Process and Methods"

1992-1994	Tianjin environmental assessment center and other seven units started the first regional level EIA on Tianjin Development Zone Planning.
1992	In the National Conference on Environmental Protection Agency, Qugeping, the first director of NEPA, said “The environmental protection departments need to actively participate in the national economic comprehensive decision-making process
1993	In the Thirteenth Annual Meeting of International EIA Conference held in June 1993, director Qu Geping formally mentioned carry out the EIA on development strategy and policies again.
	NEPA issued “Some Advices on Further Improving the Construction Project EIA Work" and carried out some requirements on the REA
1995	NEPA put forward the theory, technology and management method of improving the environmental impact assessment of regional development in the "China Environmental Protection Twenty-first Century Agenda".
1996	The State Council clearly put forward in “The Decision on Several Issues on Environmental Protection" that when making important decisions relative to economic and social development, it should has environmental impact argument.
	President Jiang Zeming mentioned in the Fourth National Environmental Protection Conference that it has to start from strategic management and establish the decision-making mechanism about environment and development.
1997	The Research Institute of Environmental Science of Beijing Normal University carried out SEA of Shaanxi Province development strategy named “Attaching Equal Importance to Coal and Electricity”.
1998	The State Council's enacted "The Environmental Protection Management Regulations of Construction Project". REA system is first time formed by in law.
2000	“People’s Republic of China Air Pollution Prevention and Control Law” is the first law that evaluates the environmental impact in the process of legislation. The EIA system expands to legislative level.
2002	SEPA mentioned SEA should be in process when produce plans of development areas in “The Announcement of Strengthening REA of Development Areas”
2003	“Law of the PRC on EIA” has been officially announced. The objects of EIA expand to plan and program level. The SEA is formed officially.
	SEPA promulgated the "Planning Environmental Impact Assessment Guidelines (Trial)" which put project EIA, REA and Planning EIA on the equally important position. Mentioned general methods and technologies of SEA of plans.

2004	“Interim Provisions on the Implementation of EIA Engineer Professional Qualification System” was implemented
	The former SEPA completed China's first national level industrial planning environmental impact assessment-"National Integration of Forest and PaperConstruction the 10th Five-year Plan and 2010 Special Plan EIA”.
	SEPA issued “the Announcement of the Range of Pans that Requires to Produce EIA Report (for Trial Implementation)”
2006	China’s first province level SEA-Inner Mongolia Eleventh Five-Year Plan SEA” reviewed by SEPA. According which Inner Mongolia government adjust targets, main projects and industrial layout
	39 academicians and scholars from the fields of economy, society, environment and resourcescomposed SEPA SEA expert advisory committee
	China's first urban master plan SEA-Wuhan national economic and social development 11th Five-Year Overall Plan Compendium SEA passed the expert review.
	Released “Interim Measures for the Public Participation in EIA”. But it is limited to the field of project EIA.
2008	Started “Five Regions Key Industrial Development Strategic Environmental Assessment”. Those SEAs broke the range of SEA in legal SEA system. The five regions SEAs are China’s first multi-regional, multi industry, high-level and large-scale SEA
2009	"Planning Environmental Impact Assessment Ordinance"has been officially announced. Standardized the procedures, contents, form and the report of SEA in plan and improved the monitor and tracking process and other restricted mechanism.
2012	MEP started the China Western Development Key Regions and Industrial Development SEA.
2014	Issued the new Law of Environmental Protection of the People's Republic of China. The Article 14 put forward that the departments of State Council and governments should fully consider the environmental impacts when making decisions about economic and technology polices. It provides the legal basis for the SEA in policy level
	MEP enacted "Technical Guidelines for Environmental Impact Assessment of Plan”
2016	Implemented new “Law of the PRC on EIA”

Resource：Summary from literature review and government document

4.2 Current SEA system

4.2.1 Legislation

Witnessing developed courtiers' experiences, in terms of environmental problems caused by industrialization (especially in the early and media stage), and the efforts they made in environmental protection, the Chinese government put the taking of precautions against environmental issues as the basic principle of environmental protection. In order to achieve sustainable development and prevent negative environmental impacts caused by new projects and plans, "since 1979, six environmental protection laws, nine resource conservation laws and twenty-eight pieces of environmental administrative regulation have been issued in China" (Schmidt et al., 2006). Hundreds and thousands of environmental regulations and standards have been made by the central or local governments.

The Law of the RPC on EIA that was adopted on October 28, 2002 and effected on September 1, 2003, marked the first time that SEA was put into national legal systems. It was a leap forward of China's environmental impact assessment regulation (Zhang et al., 2010). 'This law reveals the great attention China has paid to Environmental Assessment, including EIA and SEA' (Schmidt et al., 2006), and it is a huge improvement of the previous environmental appraisal framework. In the September, the second version law of PRC on EIA was implemented. "The change of the law is not much relative to SEA and only strengthens the punishment of illegal activities"

This law contains five parts. The first chapter describes the purpose of enacting the law, which is to "carry out the strategy of the sustainable development, prevent the unfavorable impacts of programs and constructions projects upon the environment after they are carried out and promote the concerted development of the economy, society and environment"[1]

Chapter two of the law, named "Appraisal of the Environmental Impacts of Programs", mentions the three categories of plans and programs that should carry out environmental impact appraisals, or explanations concerning environmental impacts.

Firs is the programs, or plans, relative to 'the use of land and the programs for constructing, developing and utilizing the areas, drainage areas or sea areas' conducted by 'the relevant departments of the State Council and the local people's governments at (above) the level of the cities districts, as well as the relevant departments thereof shall',

The second category is the special programs that are 'relevant special programs of industry, agriculture, animal husbandry, forestry, energy, water conservancy, communications, municipal construction, tourism and natural resources development'

The third category is 'the directive program for the special programs as mentioned in the preceding paragraph'

[1] Law of the RPC on EIA, 2016

The plan means an arrangement that will last for five years or more and will be carried out in the land and space where human activities take place. Generally, it includes a certain target, specific executor and relative implement measures, such as urban planning, land use plan, or ecologic planning (Hong and Cui, 2011)

The law also defined the range of plans: (1) they have to be enacted by government or its relative departments, rather than by companies or enterprises; (2) they have to be concerned about economy; (3) they should have some negative impacts on the environments.

Chapter three, chapter four and chapter five of the law are named “Appraisal of the Environmental Impacts of Construction Projects”, “Legal Liabilities” and “Supplementary Provisions”, respectively.

Li et al. (2004) argued that, in considering the disadvantages of the previous EIA legislation system, such as the lack of alternatives, being slower than the economic development and the range being limited to the construct projects level, the new implementation of the Law of PRC on Appraising of EI was expanding the scope of application of the EIA system and was further regulating the regional development, industrial development, natural resource development and other economic activities that have significant impacts on the environment (Gui, Zhong and Song, 2004), hence making the EIA an important basis for regional development, development plans and construction projects and increasing the monitor assessment of the implementation of plans and projects (Wang, 2005).

However, the view of the law is not unanimous. In considering the seriousness of

legislation, China has adopted a very cautious attitude regarding environmental legislation (Li and Peng, 2008). It performs in two aspects. Firstly, the legislation adheres to the principle of “appropriate comprehensive instead of details”. The majority of articles of the law are principles, while the specific, actionable provisions are lacking (Li and Peng, 2008). Practices are difficult to be guaranteed by merely the support of the principles. Thus, the introduction of the law is generally followed by implementation details that have a lower level of validity. Secondly, the legislation of the environmental law has experienced a process from regulations, or measures, to administrative regulations, ending up as the law (Wang and Tian, 2000). In the year of 1986, the "Construction Project Environmental Protection Management Measures" was promulgated, which established the EIA system in China. After being modified in 1998, the "The Environmental Protection Management Regulations of Construction Project" was enacted. The regulation reviews the evaluation scope, content, procedure and legal liability of management measures and supplies some more concrete stipulations, in order to further improve the EIA system and improve its legal level. The Law of the RPC on EIA only makes some principles of the regulation of SEA. The "Planning Environmental Impact Assessment Ordinance", enacted in 2009, and the "Technical Guidelines for Environmental Impact Assessment of Plan” in 2014 are the supplements of the Law of the RPC on Appraising EI. However, still missing are many detailed ordinance and regulations, such as the implementation of SEA in policy and public participation.

However, the legislation of “Planning Environmental Impact Assessment Ordinance” was started in the year 2005 and the manuscript for examination and approval was sent to the State Council (Li and Peng, 2008), while theordinance was only enacted as late as 2009. “The blockage and frustration of the ordinance legislation is the result of some departments, or local governments, pursuing short-term economic benefits and partial and local interests and being reluctant to support the legislation work. Also, some departments and agencies even find various kinds of excuses to avoid taking the responsibility of implementing SEA (Pan, 2007). The legislation of SEA in China has faced great difficulties (Li and Peng, 2008). The “Law of the RPC on EIA” was also introduced after a four-year argument and through a three-times NPC Standing Committee deliberation. It has to be said that the legislation of SEA has its background and practical reasons and reflects the further maturity of China’s environmental legal system. It also has the helpless and compromised aspect of facing various kinds of pressure (Zhang, 2004).

In addition, the cautions in the introduction of the “Law of the RPC on EIA” made the SEA in the policy level excluded, in the end, from the legislation system (Zhang, 2004). Furthermore, the legislation system in China was mainly introduced through legal transplant from the western developed countries. China's environmental impact assessment system is the result ofdrawing on the experiences of the western developed countries (Zhang, 2004). This transplant created conflict between the different legal cultures and the phenomenon of the difficulty of implementation. Specific state conditions and the differences in legal culture

background make foreign and ideal EIA designs lack the implementation environment in China, which results in more advanced regulations being more likely to end up on the shelf. This can be evidenced by the implementation of "The Law about Prevention and Treatment of Air Pollution".

The Law of the RPC on EIA has experienced many drawbacks. There are only 11 articles related to the SEA system in the whole law and the contents are really simple and crude (Geng, 2009). There are some legislative blanks, including the evaluation progress, forms, thinking process and content framework (Fu and Ding, 2007), and a lack of a complete regulation on reviewing procedures, methods and effects (Cai, 2009), and measures and management cannot be effectively implemented in the practices (Cui, Jiang and Liu, 2011). Compared with the Law of the RPC on EIA, the Planning Environmental Impact Assessment Ordinance has had significant improvement with 36 Articles related to SEA. Geng (2009) summaries eight improvements as follows：

a) Evaluation procedures are more clear (Including the main assessment subject, the content of the evaluation, evaluation criteria, the specific forms of evaluation documents and its compulsory content and supplementary)
b) Review process is more professional. (The third chapter provides detailed requirement on the planning of the EIA document review in the aspects of the subject, review procedures, the contents of review advices and the legal effect of such matters)

c) Monitoring procedure is more ameliorative.

d) The scope of regional restrictions approval policy is expanding. “ The planning region, in which the number of the total discharge of major pollutants exceeds the prescribed national or local control targets, should suspend the approval of the documents of new construction projects that add new major pollutants amounts”

e) The power of Environmental protection departments in reviewing the EIA documentation and monitoring the implementation of plans gets strengthened: giving the environmental protection department the right to convene a review group, so as to avoid the phenomenon that the planning production and examination and approval organizations review have self-examination.

f) Public participation mechanism is further strengthened (Articles 28). Further expand the form of public participation, including questionnaires, seminars and other forms and increase the "further proof” process, that is, "when relevant departments, experts and the public opinions have profound divergences with the conclusion of SEA, the planning producing organizations should have demonstration meetings, hearings and other forms of public participation to have further demonstration. This rule is to strengthen the legal effect of public opinion. In response to this, in the 22 articles, the range of public participation is expanding to the review process.

g) Increasing the social public reporting system. The Article 6 of the ordinance regulates: “any department and personal have the right to report to the plan

review authorities, plan producing departments or environmental protection administrative department on behaviors that violate this ordinance and plan generated significant adverse environmental impact in the implementation process”

h) Legal liability provisions are more powerful: have made clear legal liability provisions on the illegal behavior or the dereliction of duty of plan producing agencies, examination and approval authorities, the review panel, experts and evaluation technology institutions

It has to be said that the EIA system, based on the specific legal provisions, range from the “Law of environment protection” (1979 first version, 2015 latest version), “Law of the RPC on Appraising of EI”, several regulations and administrative measures represented by “Basic Construction Project Environmental Protection Management Measures", “Construction Project Environmental Protection Management Measures", "Planning Environmental Impact Assessment Ordinance" and "Technical Guidelines for Environmental Impact Assessment of Plan” and other regulations on specific fields, such as “The Marine Environment Protection Law” (promulgated in 1982), “Water Pollution Prevention Law” (promulgated in 1984),“The Law about Prevention and Treatment of Air Pollution” (promulgated in 1987), “Water Law” (promulgated in 1988), “Wild Animal Protection Law” (promulgated in 1988) and other laws also regulating the evaluation of environmental impact on the marine, water quality, atmospheric, water resources and wildlife protection (Zhou, 2008).

4.2.2 Coverage of SEA

According to the requirement of social development, the object of EIA has been increasingly expanding from initial construction project environmental impact assessment to the planning environmental impact assessment and then to the strategic environmental impact assessment in the end (Liu, 2013).

The object of EIA means the human activities that may have an influence on the environment (He, 2014). Thus, in the strict sense, any human activity that might have an impact on the environment should be the object of environmental impact assessment (Gong, 2009). In fact, only those human activities that are confirmed by law can become the evaluation objects, which can be mainly separated as specific acts in humans' lives and production processes and abstract policies, regulations and legislation, etc. (He, 2014). Because of the objects of EA being towards human activities without implementation, the object selection has features of predictability. Thus, before starting EIA, the range specific area that human activities may have an impact on the environment have to be taken into account.

The four factors determining the scope and the integrity of the country's EIA objects are: the development level of a country's environmental impact assessment system determined (Wang, 2007), social and economic development standards, government attention to environmental protection and environmental pressures from society.

The "Construction Project Environmental Protection Management Measures"

enacted in 1986 mentioned the range of construction projects in Article 2, which covered “all basic construction projects that have environmental impact related to industry transportation, water conservancy, agriculture, commerce, health, education, scientific research, tourism and municipal administration and technical transformation projects and regional development and exploration projects. The Law of the PRC on EI expands coverage of EIA in China to plan. In other words, China's environmental impact assessment object only exists at the lower level of decision-making: planning and project (Liu, 2013)

In the legislation level, we can see that China has had a cautious and negative attitude of SEA (Liu, 2013). This is evidenced by the legislative process of EIA in China.

In fact, China's EIA legislative review process is a process to reduce the scope of the object of EIA (Liu, 2010). The EIA law draft bills regulate the evaluation objects, which are "economic and technical policies and standards and plans and relative programs related to the national economic and social development”. The EIA law exposure draft shrank the range of SEA objects and changed the "economic and technical policies and standards” to “regional development, industrial development and natural resources development policy” and changed the “plans and relative programs related to the national economic and social development” to “land plan, land use plan, urban master plan, regional, basin and marine development plan and subject plan and programs in the field of industry, agriculture, energy, water conservancy, transportation, tourism and natural

resources development" . The EIA law's first review version submitted to the NPC Standing Committee further restricted the policy to "government regulatory documents", thus reducing the relevant administrative regulations, as well as other major government decisions. The EIA law second review version submitted to the NPC Standing Committee directly deleted the provisions of EIA at policy level. The content of EIA on planning could also be retained, depending on the compromise (Wang, 2006). After being ensured by legislation, the coverage was limited to "Plans made by the relevant departments of the State Council, local government above the municipal level and its departments are relative to "one land, three regions and ten special programs"

Tab.4-2. The scope of SEA in China in the process of legislation of the EIA law

Range	EIA law draft bills	EIA law exposure draft	EIA law first review version	EIA law second review version
Policy	Economic and technical policies and standards and plans	Regional development, industrial development and natural resources development policy	Government regulatory documents	NA
Plan	Plans and relative programs related to the national economic and social development	One land, three regions and ten special programs	No change	No change

Resource: Author drawn according to Wang (2006)

The SEA on plan missed two kinds of plans that also have significant environmental impacts. They are the plan made the State Council and the plan made by the town and lower level of government (Li and Peng, 2008). Along with the tide of urbanization, the role the town government played is gradually increasing and the planning has spread from cities to the remote areas (Zhao, 2014). With the decentralization reform of the government, the status and target of the urban government are changing. In the past, it emphasizes more on the planning results from cities or above level governments, but the county-level cities are also important in planning produce. County Government is a grass-roots government, and the plans they make have a direct environmental impact on the majority, in terms of quantity. To exclude the SEA system, whether viewed from the quantity or visual effect, is a great pity (Li, 2015).

In addition, because the definition of the concept of comprehensive plan, subject plan, guiding plan, non-guiding plan is not very clear, and some different plans are even overlapping or conflicting, the decision makers who are unwilling to submit an SEA report or chapter could slip through (Xu, 2008). Furthermore, the SEA only covers the range of “one land, three region and ten special programs”. Although the transportation plan and land use plan accounts for the majority of SEA in plans, the evaluation of other programs, such as trade, science and technology fields, are not within its scope (Li, 2015). In the “Planning Environmental Impact Assessment Guidelines” there are many ambiguous words when defining the objects of evaluation, such as “significant”, “light” and “very

small", which decreases the maneuverability in SEA practices. Despite the "Law of the RPC on Appraising of EI" delegating ministry of environmental protection and other relevant organizations the right to regulate the specific range (Article 9), the State Council still takes the list of the range of SEA in "the Specific Scope of the Plan That is Require to Prepare Environmental Impact Chapter or Illustration (for Trial Implementation) and "The Announcement of The Specific Scope of the Plan That Requires to Prepare Environmental Impact Report (for Trial Implementation)" (Wang, 2012)

During the period of the 11th Five-Year Plan (2006-2010), there were a total of 218 Plan EIA reports examined and verified by the Ministry of Environmental Protection Assessment Center (Tab.4-3) and many of them concentrated on the development plan of the coal mining area, development zone, rail transport, port and river basin and other fields.

Tab.4-3. EIA reports examined and verified by the Ministry of Environmental Protection Assessment Center during the period of the 11th Five-Year Plan

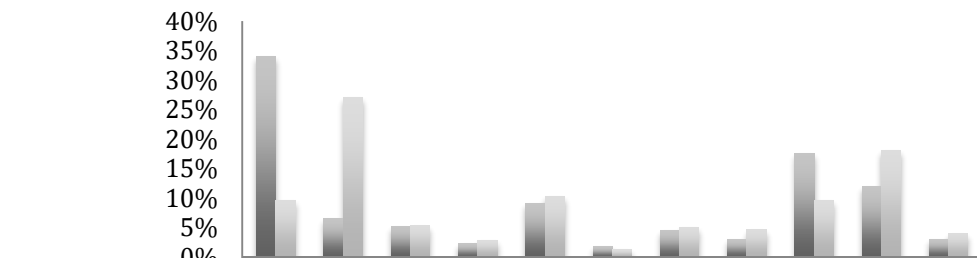
PEIA fields	**2006**	**2007**	**2008**	**2009**	**2010**	**Total**
Energy (coal-mining areas)	3	13	27	25	11	79
Regional development	3	9	13	8	2	34
Urban construction (rail transit)	2	8	8	8	6	32
Transport (ports andfairway)	5	3	4	4	13	29
River basin development	0	0	3	2	4	9
Others	10	1	10	4	4	34
Total	23	34	65	51	52	218

Resource: The right time to carry out strategic environmental impact assessment

(Ren, 2011)

The contents of the table are also verified by the research performed by Nankai University and the Chinese University in Hong Kong in 2009. Through adopting questionnaires and a literature review, they also found that the SEA practices in China mainly focused on the fields of regional development and exploration planning, urban construction planning, industrial planning, land use planning and transport planning (Fig.4-1)

Fig.4-1 China PEIA main work fields



	Land	Region	Basin	Maritime space	Industry	Agriculture	Energy	Water conservancy	Transportation	Urban construction	Tourism
Literature review	34%	6.50%	5.20%	2%	9%	1.80%	4.50%	3%	18%	12%	3%
Questionnaires	9.50%	27%	5.30%	2.80%	10.20	1%	5%	4.60%	9.50%	18%	4%

Resource:Research on the current situation and effectiveness of China's SEA (Wang et al., 2010)

Generally speaking, the EIA in China covers almost all of the construction projects and most parts of plans. In practice, we found that, although SEA covered almost the entire field mentioned in the legislation system, the SEA on land use planning

and regional development still received most attentions Urban construction planning, transport planning and energy account for the majority of SEA on subject plans. This is mainly because, since the 1990s, the regional environmental impact assessment has been the key development area. After the Law of the RPC on Appraising of EI, it continues to boom in the local level, supported by the years of development and improvement, both in practice and in research progress (Wang, 2013). The amount of practices in SEA on agriculture, forestry and animal husbandry is relatively small. In addition, compared with EIA, the development of SEA is far behind (Wang, 2010). After five years of implementation of EIA law, until the end of 2007, there were a total of 117 million various types of EIA construction projects approved throughout the country, while during the same period, only 80 SEA projects had been reviewed by the State Council relative departments (not including the SEA reviewed by local governments) (Wu and Chen, 2008; Huang, 2008), even though at the national level, in accordance with the laws and regulations, the plans that should be carried out by the SEA on plan level accounted for more than 90% of all kinds of urban master plan, industry development plan and subject plans. Thousands of various development plans were examined and approved annually, while the plans submitted to the same level of environmental protection administrative departments for SEA were really scarce (Wang, 2013).

4.2.3 Consideration of alternatives

As Wood said, “The consideration of alternatives in developing country EIAs is frequently weak” (2003). China’s legislation system is a reference to the United States, while the difference is concentrated on the attitude of the alternative (Li and Hu, 2004). The disadvantages of EIA, including the lack of consideration of the alternatives (He and Qian, 2000) since it can only provide alternatives in very limited ways (Wang et al., 2002), have been mentioned in many early researches on SEA in China. Even though the researchers commonly accept that “the making, evaluation and selection of the alternatives are the core content of SEA”(Wang, Shang and Ding, 2007), and, “in a sense, without alternatives, the entire SEA system loses its importance (Meng and Cui, 2004), there is no requirement for consideration of alternatives in the EIA system in China (Jiang and Lin, 2004), thus missing the opportunity to form a more efficient decision-making platform (Jiang and Lin, 2004) and achieve the plans with less environmental costs and highest social benefits (Gao, 2014).

Environmental impact assessment alternatives did actually exist in the “Law of the RPC on EIA (Draft)”, but were finally deleted by the National People's Congress Law Committee for the reason that requiring all construction projects to think about alternatives in the actual operation process leads to high costs, is impossible and not necessary” (Li, 2002).

The lack of the alternative directs prove there is a big gap between China's

SEA system and the advanced western countries. It also directly leads to the lack of attention on alternatives, or even missing the part of alternatives in SEA reports (Fang, 2014). Without alternatives, to a great extent, it results in the "SEA in China only presenting as a form" (Xu, 2015). At present, excluding the analysis of alternatives in China is still a very weak link in the SEA system and is highlighted by the fact that effective alternatives were not put forward or the plan was evaluated without alternatives. In other words, during the implementation of the plan, the "available one has to be applicable, the unavailable one has also to be applicable" (Xu, 2015).

We should also mention that, according to the law, the target of producing an SEA report is "to evaluate the short-term and long-term environmental impact caused by projects, mitigation measures to be taken; demonstrate and select the best plan that has technology feasibility, economic and overall arrangement rationality, and less negative environmental impacts; and provide a scientific basis for the leading departments during the project feasibility study period." In other words, in China, when making an SEA report, except for the activities prepared to be implemented, at least one alternative has to be provided to decision-makers, in order to select the "best plan". However, in practices, "unlike considering the different and alternative plans to achieve the excepted proposal, or even deciding to give up the activities, like the western counties, such as the US, in China alternatives mean using different forms, or ways, to implement the same prepared plan (Wang, 1989). For the "General Plan" and "Guide Plan" that only requires

producing the environmental impact chapter and introductions, instead of making an environmental impact report, SEA is only a correction of the original plan. Even if the plan is not reasonable and scientific, it is not necessary to take alternatives or delay and reject the plan (Li and Peng, 2008). In addition, in the “Technical Guidelines for Plan Environmental Impact Assessment”, the basic requirement of planning analysis is emphasized “by evaluating and analyzing the content of several plans…select the one that ‘relatively coordinates’ with all types of requirements as the prepared plan.” This means that, even without consideration of alternatives in the SEA process, the planning produce departments have the responsibility (although it is not compulsory) to provide alternative plans to SEA agencies for evaluation.

However, alternatives in the EIA system have undergone practices in some parts of China and are required by some local governments. For example, the SEA on the tourism region plan of the Dianchi lack in Kunming, Yunnan provides alternatives and advice to implement the decentralized depth treatment of sewage and recycle reclaimed water before the construction of the drainage pipe network, to avoid the lack of pollution control caused by the less developed water pipe network in the South District of Kunming City (Ma and Li, 2003). Shenzhen's local regulation, named the "Economic Zone Construction Project Environmental Protection Ordinance", requires that, prior to the implementation of the construction project, they should comprehensively evaluate the main process, technology and materials and their environmental impact and put forward the

corresponding alternative options, or mitigation measures (Article 11)(Cai, 2009).

4.2.4 The management of EIA institutes and fees of SEA

1) EIA quality management regulations

China used the EIA quality management regulations and regulatory documents to manage the EIA institutes. The EIA institutes should apply for construction project EIA qualification to the MEP to obtain construction project EIA qualification certification. MEP implements the classification management of the institutes and separates them into two categories, according to specific requirements, especially the qualification of experts and previous EIA experiences. Accordingly, the range of EIA is separated into eleven types of EIA reports and two types of EIA charts. The EIA reports are also ranked at first class and second class. For example, the EIA institutes that apply for first class qualification have to have at least fifteen EIA engineers, equipped with no less than six corresponding professional EIA engineers in each evaluation category, and have to have completed at least one environmental protection related research, or at least prepared a national, or local, environmental protection standards in nearly four years. The EIA institutes applying for second-class qualification should have at least nine EIA engineers. Each EIA belonging to the second category have to have at least four corresponding professional engineers.

The new “The Environmental Impact Assessment of Construction Project Quality Management Methods” that came into force on 1 November 2015

mentioned that, for the EIA agencies qualified as first class, their evaluation scope should include at least one of the first categories that are required in making the EIA report, while the EIA agencies having second-class qualification could only evaluate a project that needed to submit an environmental impact table and a project categorized in the second list to submit the EIA report.

However, up until now there is no regulation on the management of the institutes to take the responsibility of making the SEA statement. Although the name and information of the qualified EIA institute and their evaluation scope have been published on the MEP official website and most decision making departments would like to delete the SEA of the qualified agencies, some of them still hire agencies without any certification to decrease the funds, or documents making period.

Because of the lack of EIA professional experts, some engineers are encouraged to affiliate to EIA institutes to make money. In other words, they put their qualification to the specific institute and the institute, even if it cannot require them to evaluate the environmental impacts, can increase their qualification and opportunity to make more EIAs. The price for qualified EIA engineers to affiliate to the institutes is RMB 40,000-80,000 per year (Zhang, 2013).

2) Restructure national owned EIA agencies

EIA institutes are the only qualified institutes to implement EIAs delegated by the project constitute units and the SEAs delegated by decision makers in China play an indispensable role in making sure the validity and fairness of the

implementation of the EIA system (Zhou and Shi, 2015). According to the statistics of MEP, among the 1100 qualified EIA institutes, 422 have records of illegal cases, accounting for more than 1/3. In May last year, Chongqing Liangjiang development volunteer service center and Guangzhou green environmental protection service center jointly distributed "The quality report of EIA institutes" and said that, in the investigation of the 606 EIA agencies, 182 EIA agencies had a total of 319 related bad records, accounting for 30.03% of the sample EIA agencies (Zhang, 2015). Inside these institutes with illegal behaviors, most of them had issues of being "government owned or red intermediary" and corruption in EIA approval (Zhou and Shi, 2015).

Article 19 in the EIA law regulates that "the institutes providing technological services to construction project EIA cannot have any interest relationship institutes with environmental protection departments and other departments that are responsible for approving EIA documents. EIA services should be truly undertaken by the independent EIA agencies and the independent market (Zhang, 2013). However, in the EIA technical service market, the "red intermediary" phenomenon was prominent. A report by "The 21st Century Business Herald" on September 2012 indicated that inside of the national wide 1162 SEA institutes, administrative institutions accounted for 576 among them, with 333 directly connected with various levels of environmental protection systemic agencies belonging to national environmental protection systems and obtained competitive advantages compared with agencies with other background, leading to conflicts of public interests and

departments. The research conducted by Song, Bai and Kang (2010) found that, at the end of 2008, research institutes (63%) accounted for a high proportion among China's 1008 registered EIA institutes and high education centers (9%) and companies (29%) accounted for a low proportion of the overall market of the EIA institutes in general, even though the regional difference is obvious. The level of marketization is low.

This kind of connection makes SEA institutes, examination and approval agencies become communities of interest. This can be evidenced by the Huangzhou Environmental Protection System Corruption Case exposed at the end of 2009. In this case, it a common phenomenon for the Hangzhou environmental system using the right for reviewing EIA projects to charge 20%-40% EIA management fees. The EIA services institute and approval and examination agencies belonging to government environmental protection departments were corrupt together. The Hangzhou Academy of Environmental Sciences was the directly affiliated department of Huangzhou city EPA providing as high as a 30% rebate to the town level EPA, named the EIA texting project co-ordination fees, in order to compete with other IEA service agencies in the market. Attracted by high kickbacks from the Hangzhou Academy of Environmental Sciences, the districts and town EPA recommended those projects or plans they would approve to evaluate their environmental impacts in the Hangzhou Academy of Environmental Sciences. Thus, the EPA became both an examination and approval department and introducer (Zhang, 2013).

Restructured national environmental protection system owned EIA agencies played a significant role to ensure the fairness and objectivity of the EIA system. The EIA technical service industry had to get rid of the administrative background of the government and become the real market behavior to achieve healthy development. As early as 2008, MEP mentioned the reform of EIA and that the market should be truly responsible for EIA services. It was not until June 2010 that the MEP finally made their decision to start the public EIA institution reform pilot planned to gradually transform the EIA administrative institution into an enterprise, or separate their EIA duty into enterprises, so that the EIA agencies and the environmental protection department could "completely disconnect". Administrative departments and their subordinate public welfare institutions shall not become shareholders and the staff cannot act as the legal representatives of the EIA institutions and full-time EIA profession evaluators. This pilot reform started with 18 institutions directly under the environmental protection department, including the Environmental Planning Research Institute, Research Institute of Environmental Sciences, Southern China Institute of Environmental Sciences, Nanjing Institute of Environmental Sciences, etc. In April 2011, the central government published the national public institution reform category timetable, which was a statewide plan for reforming the public institutions. Encouraged by this, the MEP started the second round of pilot reform containing 79 EIA institutes

The "National environmental protection department and EIA agencies disconnection plan" was published in March 2015 by the MEP. It required that, at

the end of 2016 all the national environmental protection system owned EIA agencies had to decouple or exit the construction project EIA technical service market. At the end of 2015, eight agencies directly under the MEP firstly completed the restructuring. “The announcement of further pushing on the work of national environmental protection department and EIA agencies disconnection plan” supervised and urged the decoupling works and required that, by June 30 and December 31, the second batch and third batch of EIA institutes had to apply to decouple with the governmental environmental protect department. This plan is the significant contents of administrative examination and approval system of the EIA reform. The Environmental Science Research Institute had to speed up the transformation.

3) The management of funds of SEA implementation

The “State Planning Commission (SPE) and SEPA on regulating the relevant issues concerning the environmental impact consultation fees” provides the detailed requirement on EIA consultation fees. Construction project EIA fees have to accord with government guidance price standards. The institutes providing environmental impact advisory services should base on the provision and government standards and negotiate with delegated departments or units to determine the consultation prices, but the fee cannot exceed upper and lower 20% of the requirement standards. The environmental impact consulting fees is based on estimating the amount of investment as the billing base and adjusting the coefficient according to the different features and content of the construction

project. There were several supplementary requirements, including the "Construction Project Environmental Impact Consulting Fee Standard", "Construction Project Environmental Impact Consultation Fee Adjustment Coefficient" and "Calculation of the Construction Project Environmental Impact Consultation Fee According to the Personnel Advisory Service Per Day"

Tab.4-4. Construction Project Environmental Impact Consulting Fee Standard

Project	Evaluating investment (100million Yuan)					
	Below 0.3	0.3-2	2-10	10-50	50-100	Above 100
Making EIA report (including outline)	5-6	6-15	15-35	35-75	75-110	110
Making EIA report	1-2	2-4	4-7	Above 7		
Evaluating EIA report	0.8-1.5	1.5-3	3-7	7-9	9-13	Above 13
Evaluating EIA chart	0.5-0.8	0.8-1.5	1.5-2	Above 2		

Tab.4-5. EIA consultation service fees adjusting coefficient according to industries

Industries	Adjusting coefficient
Chemical, metallurgy, nonferrous metals, gold, coal, minerals, textiles, chemical fiber, light industry, medicine, region	1.2
Petrochemical, petroleum and natural gas, water conservancy, hydropower, tourism	1.1
Forestry, animal husbandry, fishery, agriculture, transportation, railway, civil aviation, pipeline transportation, building materials, municipal, tobacco, weapons	1
Post and telecommunications, radio and television, aviation, machinery, ships, aerospace, electronics, exploration, social services, thermal power	0.8
Food, construction, information industry, storage	0.6

Resource: SPE and SEPA on regulating the relevant issues concerning the

environmental impact consultation fees

There has been no regulation until now to manage the funds of the evaluation of strategic environmental impacts. “The fees of SEA of the same plans or programs can range from RMB100, 000 to RMB1, 100, 000”. The only document mentioning the cost of SEA, named “The announcement of further improving the work of PEIA “, was published 2006. It states the SEA consultation fee can refer to “SPE and SEPA on regulating the relevant issues concerning the environmental impact consultation fees”. However, this regulation was promulgated in the year of 2002, when the EIA law was not published and the SEA system was not established in legislation and was not even put forward as the conception of strategic, or planning, environmental impact. It can be seen in the table that the adjusting co-efficient related to industries contains the EIA in region, water conservancy, tourism, forestry, transportation etc. andSEA needs to produce a SEA report book and only the environmental quality monitoring fee needs around 100,000 (about an area of 20 square kilometers). Generally, this cannot be less than 500,000 thusthe calculation result according to construction Project EIA fee Standard is too low to be implemented in SEA.

4.3 SEA process

4.3.1 Screening the action

In the EIA system, screening the significant environmental impact is an important process, since it is “determining whether an EIA is necessary in a

particular case" (Wood and Jones, 1997). Although all human activities have happened in certain circumstances and have some trend of impact on the environment, EIA only implies in "a special type of analysis" implemented in a special range of activities by "a careful, thorough and detailed analysis", thus, there is the "need for some threshold of 'significance' being exceeded, in order to trigger the full EIA process, a procedure commonly referred to as screening" (Wathern, 2013). The most common way to determine the range of actions in developed countries is to "have developed lists of projects" (Wathern, 2013), which mainly include the type, size and the environmental consequences of EIA. The combination of the use of lists, thresholds and discretion of EIA institutions has been very common recently (Wood, 2003).

1) The classification and lists of EIA

China has implemented classified management for the environmental impact assessment of construction projects and has different evaluation requirements, according to the construction projects environmental impact degree. According to the "Construction Project Environmental Impact Assessment Classified Management List" (latest version 2015) developed and published by the SEPA, the projects classified are that

a) Cause a significant environmental impact, should produce the environmental impact report and have a comprehensive evaluation of environmental impact;

b) Cause a mild environmental impact, should produce the environmental

impact report form and have a evaluation of environmental impact or have or subject evaluation;

c) Have a small environmental impact and do not have to evaluate environmental impact, should fill in the registration form of environmental impact.

"The quality of sensitive nature and the sensitive level of the environment that the construction project is located in is the important determinant for setting the project EIA category". This is the important foundation of screening the actions in China's EIA system, as mentioned in the Project EIA Classified Management List. Briffett (1999) approved the criteria of sensitivity in selecting activities in East Asia and agreed that this "worked better" than selecting according to the size of the projects. In China, the sensitive areas include:

Nature reserves, scenic spots, world cultural and natural heritage sites and drinking water source protection areas;

a) The basic farmland protection areas, grasslands, forest park, geological park, key wetlands, natural forests, natural concentrated distribution area of the rare and endangered species of wild fauna and flora, important natural spawning grounds and feeding sites of aquatic species, wintering grounds and migration channels, natural fishery resources, water shortage area, water and soil erosion key prevention region, the land desertification closed zone, closed and semi enclosed seas and eutrophication water basin.

b) The regions mainly have the function of living, health, culture and education, scientific research, administrative office etc., cultural relics protection agencies, and the conservation areas with special history, culture, science, ethnic meaning.

Both lists and thresholds are used in the EIA in China and include 23 categories covering water conservancy , agriculture, forestry, animal husbandry and fishing, geological survey, coal, electric power, fossil oil and natural gas, black metal, nonferrous metals, metal products, non-metallic minerals and products manufacturing, machinery and electronics, petrochemical and chemical industry, medicine, light industry, textile and chemical fiber, highway, railway, civil aviation airport, water transport, urban transport facilities, urban infrastructure and real estate, social services and service industry, nuclear and radiation and 199 sub-categories. Tab.5-5 provides an example of the list of criteria for submitting the EIA report, EIA form or registration.

Tab.4-6. An example of the Construction Project Environmental Impact Assessment Classified Management List

	EIA report	EIA form	Register form	The means of sensitivity in this column
A water conservancy				
1 reservoir	The capacity of over 1000 million cubic meters; relating to environment sensitive area	Others	NA	All in a; Important natural spawning grounds and feeding sites of aquatic species, wintering grounds and migration channels b
2 irrigation district	New construction of 50,000 acres or more;	Others	NA	

project	reform 300,000 acres or more			
3 diversion project	Inter basin water transfer, large/medium sized river, small-scale river diversion over 1/4 of the natural annual runoff, or related to environmental sensitive area.	Others	NA	All in a; Important natural spawning grounds and feeding sites of aquatic species, wintering grounds and migration channels and water shortage area in b, All in c
4 flood control project	New built large and medium sized	Others	NA	
5 River regulation project	Related to environmental sensitive districts	Others	NA	All in a; Important natural spawning grounds and feeding sites of aquatic species, wintering grounds and migration channels, key wetlands, natural concentrated distribution area of the rare and endangered species of wild fauna and flora and eutrophic water areas in b; Cultural relics protection agencies, and the conservation areas with special history, culture, science, ethnic meaning in c
6 Ground water mining	Intake more than 1 million cubic meters water daily; involving the environment sensitive area	Others	NA	All in a; Water shortage area and key wetlands in b
B Agriculture, forestry, animal husbandry and fishing				
7 Agricultural reclamation	More than 5000 acres or related to the environmental sensitive area.	Others	NA	All in a; Grasslands, key wetlands, water shortage area, water and soil erosion key prevention region eutrophic

				water areas in b
8 Farmland reconstruction project	NA	Related to environmental sensitive area.	Others	All in a; Grasslands, key wetlands, water shortage area, water and soil erosion key prevention region eutrophic water areas in b
9 Agricultural products base project	Related to the environmental sensitive area.	Related to environmental sensitive area.	Others	All in a; Grasslands, key wetlands, water shortage area, water and soil erosion key prevention region eutrophic water areas in b

Resource: Construction Project Environmental Impact Assessment Classified Management List (1st June, 2015 implementation)

2) The classification and lists of SEA on plan

The SEA system in China is a large extension of the EIA on projects and the process of deterring the significance of actions is deeply influenced by traditional EIA (Sun, 2008). According to the Article 9 and Article 36 in the Law of the RPC on Appraising of EI, planning making agencies have very limited initiative in determining whether they have to produce, or under what scope to produce, an environmental impact report, since the "specific scope of programs for which environmental impact appraisals… shall be prescribed by the administrative department under the State Council in charge of environmental protection…and be submitted to the State Council for ratification" (Article 9) (Li and Hu, 2004). From this aspect, economic activities at the strategic level that should have SEA, as the specific range is determined by administrative regulation and administrative law, have to keep to the unity of legislation instead of the flexibility that is used in other countries (such as the "case by case "screening mechanism by submitting proposed action in the US) (Li and Hu 2004). Environmental protection administrative

departments have the main legislative power and the dominance in determining the scope and necessity of plans and programs that have to evaluate the environmental impacts.

The "Technical Guidelines for Plan Environmental Impact Assessment" mentioned that it is required to screen the plans that can have an influence on resources and environmental elements, according to the principles of consistency, integrity and hierarchy and form the relations among planning, resources and environment. The significant environmental and resource impacts can be identified in three aspects: whether they lead to the change of regional functions; whether they lead to the conflicts of environment and resource; whether they lead to the significant health condition changes of humans, as described below:

The significant adverse environmental impacts:

Lead to the function change of region mainly includes the implementation of the plans, which can result in the adverse changes of composition, structure and function or the loss of main function in the environmental sensitive districts, key ecological function areas and other important regions or lead to the obvious decrease of environmental quality (environmental quality grade decrease) or the loss of function of the main functional areas.

Lead to resources and environmental exploration serious conflicts mainly includes the implementation of plans, which have significant conflicts with other resources development and utilization plans and environmental protection plans in planning region or planning adjacent regions, implementation of the plan can cause

environment changes, can bring significant adverse effects to special religious, ethnic or traditional production and living mode of planning region or relevant areas or the implementation of plan can lead to adverse effects across administrative region, basin and national boundaries.

Lead to significant changes on the health status of the public includes the implementation of plans, which causes the obvious increase of heavy metals, inorganic and organic pollutants, radioactive pollution and microorganisms etc. that are difficult to biodegrade, easy bio-accumulative and have a harmful influence on humans and biology after long-term contact in the environment medium, such as water, air and soil, or the implementation of plan can have a significant increase in the risk of the contamination of agricultural, animal husbandry and fishery products and significant adverse changes in the ecological environment for human settlement.

The classified management and the division of environmental sensitive area are also applied to SEA in China. There are two official documents identifying the scope of plans relative to potential environmental impacts, named: “The Announcement of the Specific Range of the Plan for the Preparation of the Environmental Impact Report (for Trial)” and “The Announcement of the Specific Range of the Plan for the Preparation of the Environmental Impact Chapter or Illustration (for Trial)”, published by SEPA in July 2004. The range covered “one land, three regions and ten special programs”. It can be obviously seen in the table (Tab.4-7) that the main distinguish of the degree of SEA depends on the plan

produced at government level and the content of the plan.

Tab.4-7. The Specific Range of the Plan for the Preparation of the Environmental Impact Report, Chapter or Illustration

	Specific Range of the Plan for the Preparation of the Environmental Impact Report（for Trial）	Specific Range of the Plan for the Preparation of the Environmental Impact Chapter or Illustration (for Trial)
Plan related to land use		Land use master plan made by government at (above) the level of the cities with districts
Constructing, developing and utilizing the area plan		National economic zone plan
Basin construction and exploration plan		National water resources strategic plan National flood control plan Flood control, flood management and irrigation plan made by government at (above) the level of the cities with districts
Sea area construction and exploration plan		Sea area construction and exploration plan made by government at (above) the level of the cities with districts
Plan related to Industry	Industrial plans of province and government at (above) the level of the cities with districts	National Industrial development plan
Plan related to agriculture	Planting industry development plan made by government at (above) the level of the cities with districts Fishery development plan made by province or at (above) the level of the cities with districts government Township enterprise development plan made by province or city-level (or upper) governments	Agricultural development plan made government at (above) the level of the cities with districts National township enterprise development plan National fisheries development plan
Plan related	Animal husbandry development plan	National animal husbandry

to animal Husbandry	made by province or at (above) the level of the cities with districts government Grassland construction and utilization plan made by province or at (above) the level of the cities with districts government	development plan National grassland construction and utilization plan
Forestry guidance special program		Afforestation plan for commercial forest (Interim) made by government at (above) the level of the cities with districts Forest park development and construction plan made by government at (above) the level of the cities with districts
Special program related to energy	Oil (gas) field overall development program River basin hydropower plan made by government at (above) the level of the cities with districts	Energy key special program made by government at (above) the level of the cities with districts Electric power development plan (except river basin hydropower plan) Coal development plan made by government at (above) the level of the cities with districts 5 Oil (gas) development plan
Special program related to water conservancy	River basin and region integrated plan and other professional plan such as water supply and hydropower involving river and lake water resource exploration and utilization Inter basin water transfer plan made by government at (above) the level of the cities with districts Groundwater resources development and utilization plan made by government at (above) the level of the cities with districts	
Special program related to transportation	River Basin (regional), provincial inland waterway transport plan National highway network, provincial highway network and city-level	National railway construction plan Port layout plan Civil airport master plan

	transport plan Major ports and regional key port master plan Inter city railway network construction plan Container center station layout plan Local railway construction plan	
Special program related to municipal construction	Special program made by direct-controlled municipality and government at (above) the level of the cities with districts	Urban master plan made by direct-controlled municipality and government at the level of the cities with districts Urban system plan made by government at (above) the level of the cities with districts Master plan of scenery areas made by government at (above) the level of the cities with districts
Special program related to tourism	The provincial and cities at (above) the level of the cities' overall tourist areas development plan	The national tourist areas overall development plan
Special program related to natural resources development	Mineral Resources: the development and utilization of mineral resources made by government at (above) the level of the cities with districts Land resources: land development and consolidation plan made government at (above) the level of the cities with districts Marine resources: marine natural resources development and utilization plan made by government at (above) the level of the cities with districts Climate resources: climate resources development and utilization plan	Mineral resources exploration plan made by government at (above) the level of the cities

Resource: The summary of two official announcements

However, the range of the list is too abstractive and the operational is insufficient (Geng, 2009). For example, according to the lists mentioned above, a

national economic zone plan is required to produce the environmental impact chapter or illustration, while the formulation of the national economic zone plan is ambiguous. The regional planning, such as Beijing Tianjin Hebei Metropolitan Region Plan and Yangtze River Delta Regional Plan, promoted by the NDRC in recent years covers the large regions that meet the requirements of the preparation of environmental impact chapter or description. However, in the actual practices, the state-level economic and technological development zone commonly produce the environmental impact report and the files do not make clear the provisions of this requirement. Except for the general plans and special program, the national economic and social development plan has a higher status, broader range, deeper influence extent and longer time (Tang, 2009). Since the implementation of SEA law, the state has started the national economic and social development plan SEA plot works in many local areas and obtains more useful experiences. The requirement of the national economic and social development plan is also missing on the announcement list, unfortunately. The ambiguous definition of the plan range results in some decision makers playing ball to escape making SEA. For example, Shanghai Urban Planning and Design Institute has completed more than 1000 plans since 2003, while none of them had SEA. The Design Institute of the Ministry of Chemical Industry has produced more than 200 plans and programs, while only 25 of them have undergone the SEA process (Wang, 2013).

Using the form of regulations (or lists) to determine whether or not an EIA is required and whether or not the strategies have significant environmental impacts,

so as to minimize the unnecessary workload of SEA, lacks a form of publicity system for those specific plans and programs do not need to have SEA, or are defined as “no significant environmental impact”, and negatively affect the efficiency of SEA system and the “the range of public participation” (Li and Hu, 2004). In addition, the law and the announcement attempt to separate China's current plan into two different categories, general plans and special program, in order to co-ordinate with the classification of PPPs in SEA. In fact, they do not closely combine with the existing planning system and lack pertinence in the operation (Geng, 2009). In practices, this lack causes the evaluation of the same kind of plan and the program uses the same method without considering the difference of the deep planning. In fact, because the complexity of plan and the sensitivity of location are different, they may produce environmental impacts that contain significant differences（Wang, 2006）. “From the aspect of the original intention of making SEA, it is not suitable to limit the available rang of plans and programs required SEA” (Tang, 2009).

4.3.2 Scoping of impacts

Scoping is the process for determining which issues are likely to be most important during EIA and eliminates the less significant environmental concerns. Several characteristics of scoping have been defined as an early step, and open interactive process, and is the foundation of EIA. The open and integrated process

of scoping requires the engagement of different groups, especially the decision makers, the stakeholders and local people who are influenced by the projects, or have personal opinions in delineating the issues that need to be included. “Scoping is designed to canvass their views”(Wathern, 1988), although scoping of impacts in developing areas is “frequently missing, at least in so far as public consultation is concerned” (Wood, 2003).

1) The process of scoping of impact

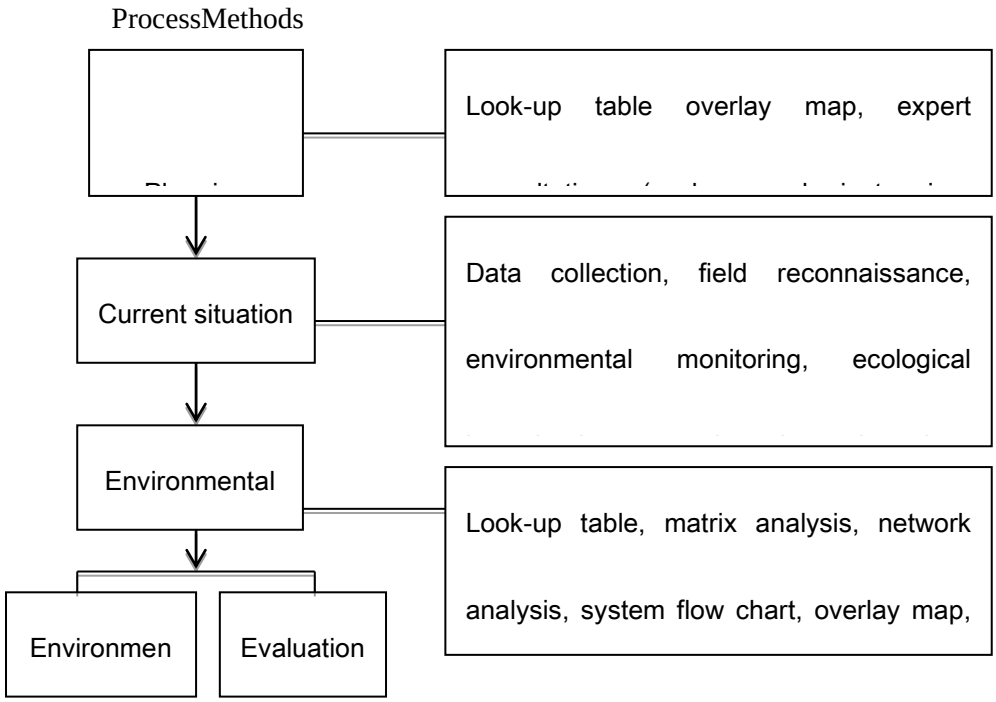
Scoping the environmental impacts of plans and programs is one of the most key processes in SEA in China. The basic ideas and working procedures of SEA in scoping the impacts are still walking the trail of traditional project EIA. In fact, the main conception and process of SEA has followed project EIA, which is the current situation-impact evaluation-forecast-mitigation-conclusion. It started from plan analysis, current situation investigation and evaluation, impacts scoping and index system formulation.

Planning analysis includes planning coordination analysis and uncertainty analysis. The former one focuses on whether the plan was co-ordinated with upper level plans and economic, industrial and environmental policies and national and local relative laws and regulations. The second one paid attention to the weakness in using the same requirement list to deal with different plans and programs on SEA, as mentioned in the last sector, and focuses on the planning uncertainty analysis, including the uncertain basic condition, uncertain specific plans and correspondence analysis towards the different basic conditions and specific plans.

Current situation investigation and evaluation contains physical geography survey, social and economic survey , environmental protection infrastructure construction and operation survey, resource endowment utilization survey, investigation of environmental quality and ecological status, depending on these investigations to analyze the resource utilization situation, environment and ecology situation, the contribution rate of major industries to the economy and pollution and reviewing of environmental impact and determine restriction factors.

Then, the environmental target and evaluation index system are built. The environmental goals in different planning periods the plan should meet can be determined according to the state and regional promulgate sustainable development strategy, environmental protection laws and regulations, resource exploration policies and regulations, industrial policies, upper level plans, regional planning, and the zoning of ecological function district, environmental protection planning, ecological construction confirmed targets and the requirement of environmental protection administrative departments and other regional and industrial environmental protection management requirements of the surrounding areas that are directly influenced by the plan. One of the main SEA processes is to ensure that the environmental impact of plans or programs exceeds the environment restrictions and environmental targets can be fully achieved.

Fig5-2. Technical guidelines for plan environmental impact assessment



Resource: Author drawn

2) The contents of the scoping of impact

Plan and program environmental impact identify means systematic analysing the potential plans and activities and their relations with the environment and then determining the environmental problems that may occur, which include impact factors identity, impact range identity and time range identity, etc.[2]Unlike the traditional EIA, when determining the environmental impacts at PPPs, it should include all direct, indirect and cumulative environmental impacts (Gui, Zhong, and Sun, 2004).

a) Impact factors identity, including the type of impacts and the form of

[2]State Environmental Policy Act (SEPA) 2000

pollution, forms the environmental impact, such as air, water, noise, and pollutant, such as TSP, SO2, COD etc., ecologic impact, such as water and soil loss and vegetation coverage and social impact, employment rate and immigration, for example.

b) Impact range covers the areas implementing social impacts

The technical guidelines are most significant in directing the scoping process of SEA in China. The table reflects the technical guidelines of SEA and other regulations enacted since the implementation of the law. The ranges cover land use plan, urban master plan and regional development plan and specific programs, such as the rail transit plan and coal industry mining area plan. When using the guides and regulations to determine the scope actions, they have to make sure the scoping actions take place at an early time, focus on both the long-term and short-term impacts of the plans and programs in and out the plan ranges, cover a broader range of impacts, such as the direct, indirect and cumulative influences on environment, ecology and society, provide clear instruction of the methods should be used and encourage wide and efficient public participation.

Tab.4-8. China's SEA technical guidelines and standard situation list

Technical Guidelines for Environmental Impact Assessment of Development Area	2003-9-1	Being implemented and has been
Technical Guidelines for Plan Environmental Impact Assessment-Coal industry mining area plan	2009-7-1	
Technical Guidelines for Environment Impact Assessment of Urban Rail Transit	2009-4-1	
Technical Guidelines for Noise Impact Assessment	2009-4-1	
Technical Guideline for Environmental Impact Assessment	2011-	

Ecological Impact	9-1	
Technical Guidelines for Plan Environmental Impact Assessment General principles	2014-9-1	
Guidelines for Environmental Impact Assessment Atmospheric Environment	2016-1-7	
Technical guidelines for environmental impact assessment of provincial land use plan	2015-12-21	
Technical specification for environmental impact assessment of municipal land use plan (for Trial)	2009-9-30	
Regulation for environmental impact assessment of river basin planning	2006-12-1	
Technical guidelines for environmental impact assessment—groundwater environment	2011-6-1	
Technical Guidelines for Plan Environmental Impact Assessment-land use plan	2009-11-9	Submit for approval
Technical Guidelines for Plan Environmental Impact Assessment-urban master plan	2009-11-9	
Technical Guidelines for Plan Environmental Impact Assessment-Onshore oil and natural gas field general exploitation and development plan	2008-10-10	
Technical Guidelines for Plan Environmental Impact Assessment-forestry planning	2009-10-30	
Technical Guidelines for Plan Environmental Impact Assessment -petrochemical base		Exposure draft or being compiled
Technical Guidelines for Plan Environmental Impact Assessment -urban transport		
Technical Guidelines for Plan Environmental Impact Assessment-river basin development and utilization plan		
Technical Guidelines for Plan Environmental Impact Assessment-port master plan		
Research Technical Guidelines for transport plan (including national and provincial highway network plan, highway main hub master plan, port master plan, port layout plan and basin (regional) and provincial inland water transportation plan		Complete research
Research on the technical method of Plan Environmental Impact Assessment-urban master plan		

Resource : Summary from the Ministry of Environmental Protection website (http://kjs.mep.gov.cn/hjbhbz/bzwb/other/pjjsdz/index.shtml), Wang (2013) and

Bao et al. (2013).

In conclusion, the scoping action of SEA in China is based on the EIA process, starting from the foundation of the plan analysis, environmental current situation investigation and environmental restriction factor analysis, instead of forming an open and co-operative system and listening to the general public, which results in the determining of environmental impacts heavily relying on quantitative and mathematical methods. It has advantages in having an early starting time, broader view of the time range and spatial range of the actions. The more specific requirements of an index system and qualitative and qualitative methods have been required in detailed rules and regulations. Relying on quantitative methods and the traditional process of EIA, environmental impacts are comprehensively evaluated, as some environmental impacts are hard to evaluate, such as social cost, with quantitative analysis and there is no clear instruction of the cumulative environment impacts. Depending too much on quantitative methods to determine the greater and uncertain SEA, while lacking in fully considering the impacts, the result may make the evaluation complex and delay the decision process, ultimately making it not possible to determine the major environmental impacts of the plan and putting forward appropriate operational requirements (Sun, 2008).

4.3.3 Preparing and reviewing of SEA report

1) The EIS and its contents

The conclusion of EIA will eventually form an environmental impact

statement (EIS), as well as the SEA. In simple terms, the SEA statement is a report document formed after evaluating the potential environmental impact caused by policy, plan, programs and other strategic behaviors. The SEA report is the result of the SEA main responsibility of complex evaluation of the process of environmental impacts, using a variety of technical means to predict the possible environmental impact of the proposal and considering alternative, or mitigation, measures to reduce the environmental impact (Ran, 2010).

It is necessary to make a list of the contents of the environmental impact report (Ran, 2010), since it makes the preparation of the EA report have a strong operability and also prevents the administrative organisations from ignoring the substantive issues, such as the considering of mitigation measures. In addition, a more detailed description of EIS can also bring convenience, or administrative, judicial and public supervision.

According to the "Law of PRC on the EIA" and "Planning Environmental Impact Assessment Guidelines", the contents of the SEA report include:

a) Principle guide

b) Planning analysis

c) Investigation and evaluation of environmental status

d) Construction of environmental impact identification and evaluation index system

e) Prediction and evaluation of environmental impact

f) Comprehensive demonstrations and putting forward the suggestion of

optimization adjustment planning scheme

g) Environmental impact mitigation measures

h) Monitor and track evaluation environmental impact assessment

i) Public participation

j) Evaluation conclusion

k) Appendixes: charts, tables and documents

And the SEA chapter and description should include

a) Basis for environmental impact analysis

b) Environmental status assessment

c) Analysis, prediction and evaluation of environmental impact

d) Environmental impact mitigation measures

e) Charts, tables and documents according to the requirement

Although, in the legislation, providing the decision-maker with a scientific base is the main proposal and function of making SEA report, in China, the report focuses on ensuring the rationality of site selection, and it is only required to report the environmental impacts caused by the planned activities and its different location schemes.

The joint work of project EIA and SEA started in 2015 and has now become the new trend and development direction of EIA work. Although, at the moment, it is only implemented in some key developed areas and covers specific programs and plans, “in order to strengthen the joint work of project EIA and SEA, the precondition must be to improve the quality of the SEA work”. Thus, a new

requirement of SEA is report making and reviewing. “The advices on strengthening the joint work of construction project EIA and plan EIA”, as mentioned in the SEA report of key development areas, should be combined with the specific characteristics of the plan and the results of the EIA, and put forward the guidance and advices on the project EIA included in the plan in the conclusion of the SEA report. For the project EIA that can simplify the content, the SEA report has a reasonable simplification list, and for the projects that need to be thoroughly demonstrated in the project EIA stage, the focus should be to put forward the significant content of demonstrating.

2) Report review and management

The process of SEA report review and EIA report view are totally different in China (Tang, 2009). Since the SEA has strong technical and political requirements, the higher level authorities often find it difficult to be armed with the professional and technical knowledge related to the planning environmental impact assessment report submitted along with draft plan. Therefore, the Law of the RPC on EIA regulates that, before examination and approval agencies make the decision to review the plan draft, they have to conjunct with the relevant experts to form a review panel to review the report.

The work of reviewing the SEA report is the responsibility of the SEA reviewing group. Before reviewing agencies approve the plan draft, the examination group has to review the plan SEA report, or chapter, and raise and put forth its opinions in writing after examination (Sun, 2008). The review panel is

established with a random selection of relevant professional experts from an expert database formed by the department of environmental protection administration and other department representatives. The expert database was formed in accordance with the relevant provisions of the State Council environmental protection administrative department.

The SEA documents reviewing processes are separated into two types, according to the level of the producing departments. The MEP and the relative agencies have the duty to make reviewing measures of SEA documents for the special programs that have to be examined and approved by the provincial level or above government and relevant departments. For the draft of a special program that has to be approved by the city (cities with districts) level governments or above, before making the final decision, the governments should form a reviewing group containingrepresentatives from the delegated environmental protection administrative departments, or other departments, and experts to review the SEA report.

When the special programs producing agencies apply for approval of the plan draft, they have to submit the SEA report to the examination and approval agencies. Without the SEA report, theexamination and approval agencies cannot review (Article 12). At the same time, the conclusion of the SEA report and review comments have to become the important basis when the cities with districts governments or above and the provincial government relative department examine the special programs plan draft (Article 14). According to the above provisions, the

SEA report is a necessary condition for the approval of special programs. These regulations are conducive to the effective implementation of the SEA system, and this is a security provision. For the SEA system, through the approval of the planning, this guarantees the administrative supervision, in terms of the impact assessment. Therefore, from this point of view, the "SEA system exists in an indirect form of supervision, and this model of approval only ensures the implementation of the evaluation of environmental impacts, instead of guaranteeing the quality of the implementation of SEA (Tang, 2009)

In order to systematically implement the joint work of SEA and EIA, when reviewing the environmental impact report on the key development areas, the environmental protection departments are required to consider the guidance SEA provided to EIA as an important part of reviewing and have a clear illustration of the examination and reviewing advices. The project EIA guidance reviewed by the reviewing groups in SEA can become a basis of the simplification of the EIA documents. At the same time, before the environmental protection departments approve the project EIA, they also have to analyze the involved SEA, think highly of the SEA conclusion, review the comments and simplify the EIA documents, so that the construction project meets the requirements of the SEA.

The MEP published the "Guidance on carrying out the consultation of the plan EIA (Trial) (MEP, 2015, No. 179)" and established the consultation system in SEA, which means the SEA report now has to be reviewed and approved by the specific consultation groups.

According to the guidance, the planning making authorities should organize the consultation with the help and guidance of the environmental protection departments before sending the environmental impact report to be reviewed and submit the comments of the consultation and the SEA report to the environmental protection department. The consultation materials include the SEA report and other related documents, and the provincial (autonomous regions and municipalities) government, or relevant department, has to be invited to attend the consultation.

It is required that the SEA report should analysis and forecast the transboundary environmental impact and sort the provinces and cities in the planning areas, or adjacent to the planning areas, according to the extent of the adverse impact. Thus, the planning making agencies have to improve the SEA report contents according to the consultation results and take the consultation views as an important basis for improving the SEA and adjusting the draft plans. If the views from the consultation cannot be adopted, they should provide a description of the reasons in a written form. The SEA reports reviewing and management also have to invite representatives of the consultation group to engage in a reviewing conference.

Even though the SEA that are convened and reviewed by the provincial environmental protection departments and may result in cross regional (basin) environmental impact are encouraged to implement consultation work, at the moment, this is limited to national industrial park SEA located in the Beijing, Tianjin and Hebei region, the Yangtze River Delta and Pearl River Delta region and

cover the leading industries, including petrochemical, chemical, non-ferrous metal smelting, iron and steel, cement industries, Beijing, Tianjin, Hebei and the surrounding areas coal electricity based SEA and national watershed comprehensive plan and hydropower development plan SEA.

The group only has the right to review, but not approve. In the views of the group, in the legislation system, there is no compulsory regulation that they have to be accepted by the examination and approval departments. If the departments do accept , they are only required to submit a description, without regulations on the legal responsibility they should assume (72).

The reviewing of SEA report is an examination of the quality of the SEA. Bram (2004) mentioned that the quality of the experts on the examination panel restricts the quality of the SEA decision. The value of experts' opinions is always overrated, while the views of the local public and stakeholders have always been considered less comparatively. Thus, the publicity of the environmental impact report becomes extremely important.

3) The publicity of environmental impact assessment report

The government enacted the "People's Republic of China Government Information Disclosure Regulations" and "Environmental Information Disclosure Measures (for Trial) on 1st May 2008, in which Article 11 requires that ""After accepting the construction project EIA documents, environmental protection administrative departments have to publish the acceptance status and the results of

approval on their official website and use other ways convenient to let the public know". However, it is uncertain about whether the open process of acceptance and approval includes the EIA document. In addition, the attitude of the MEP on the openness of environmental impact documents is changing from the negative and passive ways to positive ways in the openness of the contents of the EIA document, which depends heavily on pressure from the State Council (see the table.). In January, 2008 the former NEPA's "Reply letter to relative questions about public apply for open construction EIA documents (Environmental Letter 2008, No.50)" mentioned that the EIA documents, including the EIA report (form) the environmental protection department obtained from construction units, do not belong to the range of "Environmental Information Disclosure Measures" and do not need to be open. The "Environmental Letter 2008, No.50" was abolished until 2012 by the MEP through the "MEP announcement 2012, No. 60", for the reason that it does not co-ordinate with the "People's Republic of China Government Information Disclosure Regulations" published on 1st May 2008. Actually, although the "People's Republic of China Government Information Disclosure Regulations" was implemented in May 2008, the MEP was very sure that the regulations were approved in January 2007 and published in the April (Zhu, 2015). Later, in August, 2012, the MEP, in the "The Announcement of the Requirement of Making Construction EIA Report Abridged Edition", emphasized that environmental protection agencies had to have open project approval status, open the abridged edition of the report and attach the contact information of the licensing

authority encouraged by the State Council in "The announcement of 2012 government Information disclosure key work arrangement" published in April. In 2013, the State Council mentioned further improving construction project EIA information openness and required the MEP to identify the relative requirement and guide the environmental protection department to implement the whole process of openness. In November, 2013, the MEP office finally required disclosure of the full text, both the EIA report and form, except for state and business secrets. The new version, "The Environmental Protection Law of the People's Republic of China", was implemented on 1st January，2015 and they had a positive response to the publicity of project EIA documents. The new environmental protection law Article 56 mentioned that "the department had the responsibility to censor project EIA documents having full open text after receiving the EIA report, unless related to national and business secrets. This regulation marks the establishment of the government publicity regulations on EIA documents in China's basic law system.

Tab. 4-9. The policy of EIA and SEA report openness

Documents	Time	Agencies	Contents
Reply letter to relative questions about public apply for open construction EIA documents" (Environmental Letter 2008. No.50)	2008.1.30	NEPA	The EIA documents, including EIA report (form) environmental protection department obtained from construction units do not belongs to the range of Measures
The Announcement of abolishing Environmental Letter 2008. No.50 from Ministry of Environmental Protection" (MEP announcement 2012.	2012.1.9	MEP	(Environmental Letter 2008. No.50 does not coordinate with "People's Republic of China Government Information Disclosure Regulations" published 1st May, 2008

No. 60)			
The announcement of the requirement of making construction EIA report abridged edition (MEP announcement 2012. No. 51)	2012. 8. 25	MEP	In order to…and further strength the degree of EIA public participation and protection the public right to know, supervise and participate…environmental protection agencies have to open project approve status, and open the abridged edition of the report and attach the contact information of licensing authority
The announcement of 2012 government Information disclosure key work arrangement (State Council published 2012. No. 26)	2012.4.28	State Council	…Require strengthening environmental verification and approval information disclosure especially improves the openness of project EIA, industrial protection check…
The announcement of further strengthen the openness of environmental information protection (MEP Office 2012. No. 134)	2012.10. 30	MEP Office	EIA report abridged edition as one of the approval conditions, should publish to the environmental protection administrative department website along with project EIA documents approval status at the same time
The announcement of the print and distribute of key work arrangement of government information disclosure (State Council published 2013. No. 73)	2013.7.1	State Council	Further improve construction project EIA information openness, require MEP identity relative requirement and guide environmental protection department implement the whole process openness
The announcement of the key work arrangement of government information disclosure (MEP Office 2013. No.86)	2013.9.16	MEP Office	Base on the publish the construction EIA documents accept condition, approval result, check result and abridged edition, publish EIA and project complete environmental protection approval documents, environmental protection measures commitment document, and implement openness of whole acceptance, examination and

			acceptance inspection.
The announcement of the print and distribute of construction project EIA government information disclosure guide （MEP Office 2013 No. 103）	2013.11. 14	MEP Office	The disclosure of the full text both the EIA report and form except state and business secret

Resource: Author drawn according to literature review

Compared with the efforts of the government to encourage information openness of construction project EIA, the publicity of SEA reports on plans and programs is not included either in the People's Republic of China Government Information Disclosure Regulations" and "Environmental Information Disclosure Measures (for Trial) or in the new version of the environmental protection law.

The law of environmental impact assessment (Article 11) mentioned the requirement of SEA report information disclosure as follows:

> *"In case a program may cause unfavorable environmental impacts or directly involve the environmental interests of the general public, the organ… prior to submitting the draft of the programs for examination and approval, seek the opinions of the relevant entities, experts and the general public… except it is provided by the state that it shall be kept confidential "*
>
> *"The drafting organ shall take the (their) opinions…into careful consideration, and shall attach a remark whether the opinions are adopted or refused to the report"*

This means the information disclosure of SEA reports does not contain the SEA of plan and only a limited range of specific programs that cause unfavorable environmental impacts, or directly affect the public, and there is no requirement for an organisation to inform the public about the result again. They only have to write

a description for the examination and approval agencies. Whether the opinions of the public have been adopted and have affected the decision-making is unknown to the public.

The MEP published the information disclosure directory (first batch) in 2008. The type of information that needed to be open relative to the EIA can be seen below. Among the nine types of information that required to be published, only two are relative to SEA. They are SEA review information and technical support. This is because the SEA requires much more professional knowledge and technical support. However, for the general public and stakeholders, the meaning of open technical support is very weak. The SEA report and basic information are hidden from the public's eyes.

Tab. 4-10. EIA information disclosure directory

Environmental impact assessment		
Construction projectEIA and acceptance management	1	Construction project information
	2	Construction project approval information
	3	Construction project acceptance information
Planning EIA Management	1	Planning EIA review information
	2	Planning EIA technical support
Construction project EIA qualification and personnel management	1	Construction project EIA certificate management information
	2	Construction project EIA qualification assessment information
	3	EIA post certificate management information
	4	EIA engineer professional qualification registration management information

Resource: Information disclosure directory (first batch)

"The announcement of the issuance of the 13th Five-Year EIA reform implementation plan" promulgated by the MEP on 15 July 2016 mentioned that improving the government information disclosure would be the main task in the

13th five year period, by establishing a government information disclosure mechanism based in environmental protection departments websites and fully publishing the EIA documents, the admissibility of the application and review or approval opinions. It specifically emphasized the openness of SEA implementation and stressed that “plan making and approval authorities initiatively carry out the SEA information disclosure and make an information disclosure plan for SEA of the major sensitive plans and programs”. According to the announcement, the regulations and plans for the openness of SEA would be improved and information disclosure of the SEA report of the major and sensitive plans or programs might be achieved in the 13th five-year period. However, from the experience of the information disclosure of EIA, which took more than seven years from the first mention of environmental information openness in 2008 to the full open text of the EIA report in 2015, fully publishing the SEA report might need more time.

4.3.4 The follow-up evaluation of SEA

There are three important factors of EA: evaluation and analysis, mitigation and tracking and monitoring (Ran and Hu, 2015). Because of both the prediction results and the efficiency of the proposed measures and mitigations, we must use the "tracking and monitoring" to carry out the verification. In addition, “Plan and program SEA are more complicated than the construction project which has a longer and wider influence on the environment” (Dipper and Wood, 1998; Ahammed and Nixon, 2006) and, thus, it is a requirement to continue periodic

monitoring and evaluation in the process of plan implementation, instead of only before the implementation of plans (Zhou et al, 2009). However, in China, the SEA faces many restriction elements, such as the lack of knowledge of the public and the unstable development foundation，and many regions and departments have not given sufficient attention, which results in the implementation of SEA being a mere formality (Wang and Xu, 2015). Added to the many uncertainties in the planning itself, to achieve the goal of planning EIA and reduce its uncertainty, this requires strengthening the monitoring and administrative management.

Applying the follow up evaluation of strategic activities implementations came from the idea of applying a post environmental impact evaluation (or post-project evaluation, post project review, post appraisal and post-project analysis etc.) into the project management system (Chen, 2008). Post-project analysis is implemented to track, monitor and review the assessment of the environmental impacts and the effectiveness of the remedies, or mitigation, after the building and using the construction project, finally achieving co-ordination with the construction project and environment.

The definition of follow up evaluation can be traced back to the early 1980s (Zhou, et al, 2009). At first, it was mainly used to assess the quality of the environmental impact assessment report and then mainly focused on theoretical exploration, including the basic concept, function and significance, methodology, etc. (Huang et al., 2011). The implementation of follow up evaluation is considered

as an important measure to understand the actual environmental impact of strategic actions.

Caldewell et al (1982) and Fischer (2002) claimed that follow up evaluation is the general term for a series of activities, including monitoring, auditing, ex post evaluation, post decision analysis and management. According to Morrison-Saunders and Arts (2004), it can be defined as

"The monitoring and evaluation of the impacts of a project or plan (that has been subject to EIA) for management of, and communication about, the environmental performance of that project or plan."

Articles 15, 19, 27 and 28 in the "Law of the RPC on EIA" added the contents relative to environmental impact post monitoring and follow up evaluation. Post project analysis and follow-up inspections are regulated in Articles 27 and 28 as being two ways to minor environmental impacts after the construction project is put into production or use. Construction entities have the responsibly to organize the post-project assessment "when any circumstance that is inconsistent with the approved environmental impact appraisal document occurs…in the process of building or operating a project". At the same time, "the original examination and approval department…may (also) order the construction entity to conduct the post-appraisal of the environmental impacts and take measures for improvement". The administrative department of environmental protection has the responsibility to carry out follow-up inspections after the completion of the project construction or to find out the causes and those responsible for any serious environmental pollution

or ecological damages.

While the follow up evaluation of SEA was required in Article 15 as the way to monitor the impacts caused by plans and programs implementation, it was clearly defined that, after the implementation of plans or programs having significant adverse influences on the environment, the plan-making department had to timely organize the follow-up assessment of the environmental impact and report the evaluation results to the examination and approval authorities. When obvious disadvantages of environmental impacts are found, it should timely put forward improvement measures. What should be highlighted here is that the available range of follow-up evaluations had to meet two requirements. Firstly, it was only suitable for plan SEA, instead of the EIA of construction projects. The scope of the application of the SEA follow-up evolution is determined by the characteristics of the plans and programs. SEA cannot model construction project EIA for the post evaluation after the completion of projects. Instead, it needs to carry out a timely environmental impact follow-up evaluation mechanism once and several times in practice during the implementation of plans or programs (Chen et al 2008).

Secondly, the articles are only available for the plans that the implementation of which may cause significant environmental impact, instead of all plans. However, the Law of the RPC on EIA, technological guides and other regulations do not define the scope of "significant environment impacts" (Zhang, 2011; Chen et al 2008). Therefore, in practice, there is a fuzzy zone for the operation of SEA follow-up evaluation, which results in some decision makers evading assessment of

those plans or programs that should have had tracking evolution.

Although not mentioned in the technical guidelines for PEIA general principles, some detailed guidelines (technical guidelines for PEIA on land use plan for example) put forward the requirement of making a dynamic management plan to monitor the following environmental impacts and implementation of mitigation methods. The decision making department have to produce a dynamic supervision and management plan on the development of various types of environmental sensitive areas, important ecological protection zones and ecological fragile areas, according to the evaluation indicators proposed in the EIS. The environmental protection department at the same level is responsible for monitoring the implementation of SEA and mitigation measures.

According to the technical guide, the follow up evaluation of SEA contains three stages. When making environmental impact assessment documents, the SEA institute and planning making departments have to propose a follow up evaluation scheme and put forward the management requirement of planning uncertainty. During the whole process of the implementation of SEA, the planning making departments and relative environmental protection departments have to monitor the actual resources and environmental and ecological impacts caused by the plan implementation. Finally, the data, resource and evaluation results resulting from the follow up evaluation can provide reference for plan adjusting and the next round of decision-making, and provide a basis for the construction project management in the planning implementation region.

In the technical guidelines, there is a requirement of including follow-up evaluation contents when making SEA reports and to "detailed describe the proposed tracking scheme and discusses the specific requirements of tracking evaluation", while, for plans and programs, they only need to prepare an environmental impact chapter or description, and following-up evaluation is not required. On one hand, for the plans only making an environmental impact chapter or description, they may still have a significant impact on some environmental factors after the implementation (Zhang, 2011). On the other hand, since planning the implementation can be short-term (5 years) to long term (10 or 20 years) and is a continuous development process, during this period of time, how many times follow-up evaluation should be taken is uncertain and not determined by either the SEA report making, or reviewing.

In conclusion, "the more specific the follow up evaluation scheme is, the more advantages decision making agencies can receive in implementing the follow up evaluation" (Zhang, 2011). However, currently, the relative laws and technologic guidance still require improvements. However, the current EIA system is more concentrated in the project construction or planning making stage (Chen et al, 2008). How to carry out the post evaluation does also lack clear and specific requirements, which leads to blindness in making a tracking evaluation scheme and is also not conducive to the inspection and supervision of the development (Zhang, 2011)

Chapter five: the embedded duality in SEA implementation

5.1 The research organization and case selection

5.1.1The criteria of case selection and case description

1) Case selection criteria

As discussed previously, even though the gap between the western region and eastern region is wide, in terms of economic and social development standards and regional policymaking and policy implementation, a gap also exists between the provinces in the same regions. The separation of the eastern and western regions does not only depend on the economic and social development level and the target of national strategy, but it is also restricted to geographical continuity. Thus, some provinces in the western region may be more advanced than others (Chongqing for example), while some provinces in the eastern region may be less developed than others (Hainan for example). The first questions that need to be answered in relation to the case studies is which provinces in the eastern region can be classified as the most advanced provinces in SEA and which provinces in the western part are the less advanced. There are three aspects of criteria used to select the cases:

a) The selected cases should be at the same administrative level

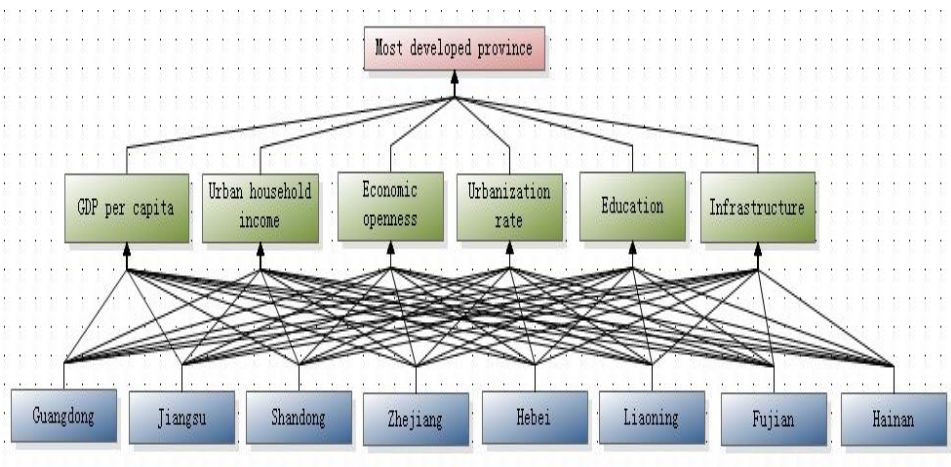
The regions should be at the same administrative level : Province level or

autonomous region (direct-controlled municipalities, including: Beijing, Tianjin, Shanghai and Chongqing, are not included)

b) Social and economic development standard

The social and economic development standard of the region is used to reflect the "duality" of the different provinces. According to previous research, the author selects six indexes (GDP, average citizens' household incomes, economic openness, urbanization rate, higher education rate and infrastructure) and uses AHP (Analytic Hierarchy Process) analysis to evaluate the economic and social development standards of the western and eastern provinces, respectively. Software named Yaahp (Yet Another AHP) V7.5 is utilised to simplify the calculation.

Fig.5-1. The three hierarchies of selecting the most developed provinces



Resource: The interface of YaahpV7.5

AHP is an analysis method and a structured technique used to select the best decisions by deconstructing the elements relative to decisions in aim, index and

proposals. It was developed by Thomas L. Saaty in the 1970s and has been widely used in various fields of research. In this research, the author depends on six indexes to select the most developed and less developed provinces in the region. The weight of element can be found in the following table after discussing with experts. The consistency is 0.05 <0.1 and satisfies the consistency checking.

Tab.5-1. The weight of six indexes

	GDP	Incomes	Economic openness	Urbanization rate	Education	Infrastructure
GDP	1	1/3	1/5	1/7	1/5	1/7
Incomes	3	1	1/7	1/5	1/3	1/7
Economic openness	5	7	1	1/3	1	1/3
Urbanization rate	7	5	3	1	3	1
Education	5	3	1	1/3	1	1/3
Infrastructure	7	7	3	1	3	1

1: two elements have the same importance
3: one element is slightly more important than the other
5: one element is obviously more important than the other
7: one element is significantly more important than the other

According to the AHP, the most advanced four provinces are Jiangsu, Zhejiang; Guangzhou and Fujian and the less developed four provinces are Tibet, Qinghai, Guizhou and Ningxia.

c) The number and range of the SEA practices of various regions

Because this research focus on the SEA policies and implementation gap, a certain number of PEIA projects should be down and some practices experiences should have in order to receiving the true process and problems in SEA implementation. Thus another element considered in selecting cases is the number

and range of the SEA practices of various regions. In considering the difficulty in collecting the data of all SEA plans and programs at various levels (town, city, province) in a large number of provinces, this paper uses the data of SEA (PEIA), approved by the MEP Environmental Engineering Assessment Center, from January 2015 to September 2016 (see the following table). The MEP Environmental Engineering Assessment Center directly belongs to MEP and is responsible for examining the EIS of significant, or cross provincial, range plans, programs and construction projects.

Tab.5-2. SEA (PEIA) of different provinces approved by MEP Environmental Engineering Assessment Center from January 2015 to September 2016

Eastern	Project No.	Areas	Area No.
Jiangsu	27	Region: industrial; port; transport; river	4
Fujian	7	Transport ; port ; industrial park; region; energy	5
Guangdong	7	River; port ; transport	3
Zhejiang	7	Transport, land use; energy	3
Shandong	4	Transport, urban;	2
Tianjin	3	Transport	1
Hebei	2	Transport	1
Beijing	2	Transport	1
Western			
Neimeng	7	Energy; transport	2
Qinghai	6	River; transport,	2
Sichuan	6	Transport; tourism; river	3
Xinjiang	6	Transport; land use; energy;	3
Gansu	5	Land use ; river	2
Shaanxi	4	Energy; transport; urban	3
Guizhou	3	Urban ; transport ;River	3
Yunnan	3	River; transport	2
Ningxia	2	Transport	1
Chongqing	2	River; transport	2
Guangxi	1	Transport;	1

Central			
Helongjiang	6	Transport; land use; river; energy	4
Shanxi	5	Energy; transport; river	3
Jilin	4	Transport;	1
Anhui	3	Land use ； Transport	2
Hunan	3	Tourism; transport;	2
Henan	2	River	1
Hubei	2	Land use; transport	2

Resource：Author dawn according to date provided on the China Environmental Impact Assessment website: http://www.china-eia.com/index.htm

From the table above, it can be seen that eight out of the eleven regions in the east had their SEA approved by the MEP Environmental Engineering Assessment Center. Jiangsu had 27 significant plans or programs examined, which covered the range of transport, port plans, industrial park, region development plan and river comprehensive development plan, and was ranked top in both number and range in the state. Fujian, Guangdong and Zhejiang have also had many experiences of SEA, including the fields of transport, industrial parks, river comprehensive development, land use and energy plans. For Inner Mongolia in the western region, despite the large size of the plans or programs submitted to the MEP, out of the seven, five belonged to the energy development plan (coal mining plan for example) and the other two were transport plans.

In considering the administrative level, social and economic development standard and SEA development standards and practices, the criteria is:

Do the provinces in the eastern region accord with

i. *The top four (1/3) provinces with most developed economic and social development*

standards?

ii. *The top four (1/3) provinces with largest number and range of significant and key plans or programs?*

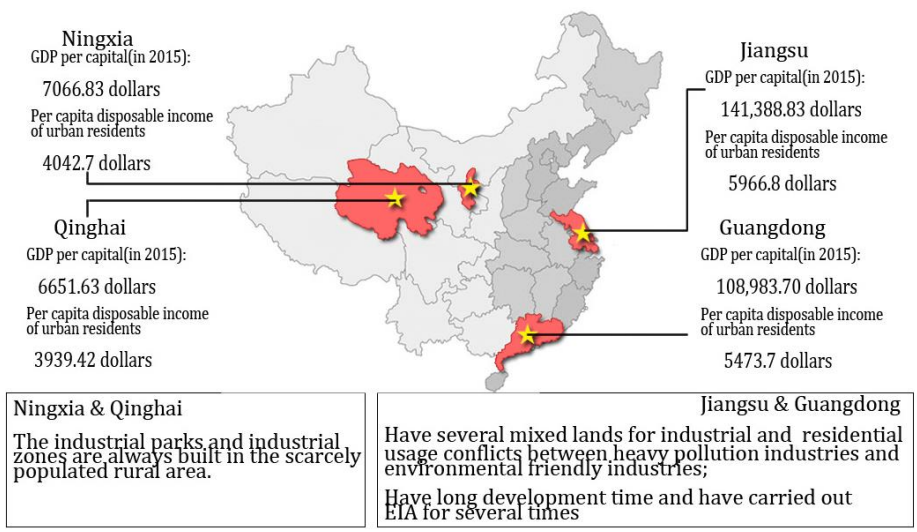
Is the province in the western region in

i. *The top four (1/3) provinces with least developed economic and social development standards?*

In conclusion, four provinces are selected for the case studies. They are Guangdong and Jiangsu located in the Eastern China and Qinghai and Ningxia located in Western China.

2) Case description

Fig. 5-2. The location of case provinces



Resource: author drawn

Qinghai is a large and sparsely populated province located in western China. It

is spread on the northwestern Tibetan Plateau that is the plateau with the highest altitude in the world. The average elevation of Qinghai is over 3,000 meters above sea level (). According to the second national land survey bulletin, the land area of Qinghai Province is about 1200 kilometers from east to west and 800 kilometers from north to south, with an area of 721 thousand square kilometers. Qinghai is the home of 5.834 million people and only 54% of them are *Han* nationality. The Tibetan people and Hui nationality occupied 22.5% and 15.6%, respectively, based on the Fifth census data (in the year of 2000). The main cities of Qinghai are the capital city Xining, Donghai, Haibei, Guoluo and Yushu, etc. The GDP per capital at the end of 2015 was 6651.63 dollars and the per capita disposable income of urban residents was 3939.42 dollars.

Ningxia is one of the five ethnic minority autonomous regions in China. It is located in the upper reaches of the Yellow River in western China. The area of the province is 66.4 thousand square kilometers. The distances from east to west and from north to south are 250 kilometers and 456 kilometers, respectively. The permanent resident population is 6.615 million, among which 33.9% are *Hui* ethnic minority (Fifth census data). Ningxia has five cities, named Yinchuan, Zhongwei, Guyuan, Wuzhong and Shizuishan. Yinchan is the capital city of the province. The GDP per capital was 7066.83 dollars at the end of 2015 and the urban resident disposable income was 4042.7 dollars.

Jiangsu is located in the center of eastern coastal China and the downstream of Yangtze River and Huaihe River. It is close to the Yellow Sea and is an important

part of the Yangtze River Delta region. Along with Shanghai, Zhejiang and Anhui , Jiangsu constitutes the Yangtze River Delta metropolitan areas and has become one of the six most metropolitan areas in the world (Xinhua News, 2012). The plain area is more than 70 thousand square kilometers in Jiangsu and accounts for more than 70% of the province's area. The proportion of the plain of the province is the largest in China. "The GDP per capital of the provinces, comprehensive competitiveness and development and life index (DLI) of Jiangsu ranked at the top of China's provinces, which makes Jiangsu the most developed province in China" (Ji, 2013). The area of Jiangsu is 107.2 thousand square kilometers. The number of permanent residents was 79.76 million at the end of 2015. The per capital GDP was 141,388.83 dollars and the annual urban resident disposable income was 5966.8 dollars. There are 13 cities in Jiangsu, including Nanjing, Wuxi, Xuzhou and Yangzhou, etc.

Guangdong islocated at the southern coast of the mainland of China and is the province with largest population size. There are 108,490 million residents in Chuangdong living in 21 cities. Some of the main cities are Guangzhou, Shenzhen, Foshan and Dongguan, etc. The area of the province is 197.7 thousand square kilometers. Guangdong is the fastest developing province in economy and ranked as the top one in China's economic aggregate. From the economic openness in 1978 to 2012, according to the absolute number, the amount of GDP of the province increased 307 times and was ranked top in China during the 23 years

period from 1989 to 2012. Guangdong province also has the most economic openness. The average annual imports and exports accounted for about one quarter of the country ’s and was ranked the top province in China from 1985 to 2012. The accumulated foreign investment of Guangdong province also accounted for about one fourth of China’s and was rank first in the country from 1989 to 2012 (). In the year of 2015, the GDP per capita in the province was 108,983.7 dollars and the urban resident disposable income was 5473.7 dollars.

5.1.2 Economic development zone and economic development zone PEIA

A development zone is a specific region planned by the local government. In the year of 1984, representative coastal cities held a conference in Beijing and argued how to increase the degree of economic openness and reform and use the foreign investment and put forward a motion to form economic development zones (Ouyang et al, 2013). It is a collective name, covering an economic and technological development zone, high-tech industrial park, bonded area, free trade zone and all kinds of industrial parks, such as chemical industrial parks and automobile industrial parks, etc. The development zone can be one industrial park or consist of several industrial parks. By putting forward tax relief, land price and government support preferential policies and constructing a complete set of facilities, the development zone is expected to attract capital and investment and improve its economic agglomeration and then stimulate the economic development of the region. Development zones can be separated into national level development

zones and provincial level development zones. The development zone establishes a Development Zone Management Committee and the Development Zone Investment Co., Ltd. is responsible for the investment and construction of the region. Since the development zone also has government functions, the main manager of the development zone is often part-time or full-time appointed by the local government administrative senior manager.

The regional environmental assessment (REA) started much earlier than the legislation and normalization of SEA in 2003. Since the late1980s, some early REA practices, including petroleum and agricultural resources, integrated the development of the Liaohe River Delta region, produced by Shenyang Academy of Environmental Sciences (from 1989 to 1992) and in Zhuzhou city, the Hunan of western river region development project was completed by the Zhuzhou Academy of Environmental Sciences in 1988. Since the 1990s, increasing attention has been given to REA, especially after the publication of the “China 21 century agenda”, which mentioned the requirement of improving and perfecting the theory and technique and management of REA and carrying out REA throughout the country. Some examples in this period include the Tianjin Economic Development Zone REA and Yellow River Delta Agricultural Resources Development Zone REA(). However, at this stage, the management of REA at that time was based on projected EIA. “Some Advices on Further Improving the Construction Project EIA Work" were put forward by theformer SEPA in 1993 to “have effective influences on development zone REA management” (Ouyang et al, 2013). "The

Environmental Protection Management Regulations of Construction Project" promulgated by the State Council in 1998 required producing REA during the construction of development zones. The technology guides for REA were based on the Nation Environmental Protection Standards Hj/T.2.1-2.3-93; Hj/T.2.4-95 and Hj/T.19-97 and the producing process and methods of REA were similar to EIA. The REA was still limited to evaluating and controlling the environmental impacts caused by exploration and development after the developments were designed and planned.

The law of EIA implemented in 2003 mentioned the range of SEA covering "one land, three regions and ten programmes". Then, the REA, as an important part of SEA, normalized into the SEA system. The environmental assessment of regional development plan, especially the economic zone development plan, is a significant component of the SEA system. The publishing of the "Development Zone REIA technical guidelines"and "Planning Environmental Impact Assessment Guidelines (Trial)" in 2003 separated the economic development zone PEIA from the traditional project EIA. The working process, methodology and intervention time of PEIA separated from the traditional project EIA and then integrated with SEA.

According to the China Economic Development Zone website, until October this year there were 219 national level economic development zones. The number of economic development zones at the provincial level was around 1164. Various industrial parks were also established by the municipal People's governments at the

county level. At present, most of the national and provincial level economicdevelopment zones have carried out PEIA work with rapid economic development and industrial upgrading, and many development zones began expanding areas, changing location and upgrading industries. Some development zones have already started PEIA in the process of reconstruction and relocation, such as Yangpu Economic Development Zone (in Hainan province), Fuzhou Economic and Technological Development Zone (in Fujian province) and Zhanjiang Economic and Technological Development Zone (in Guangdong province). All four case provinces have actively carried out SEA practices on development zones.

5.1.3The Economic development zone and PEIA in the four provinces

There are two in Ningxia (Yinchuan economic development zone and Shizuishan economic development zone) and two in Qinghai (Xining economic development zone, Golmud and Kunlun economic development zone). Guangdong has six national level economic development zones and Jiangsu has 15 development zones, which are the provinces with the largest number of national economic development zones. Turning to the provincial level, Qinghai, Ningxia, Guangdong and Jiangsu have one (including 18 industrial parks), 14 (including 31 Industrial parks), 64 and 84 economic development zones, respectively.

China formally decided to open 14 coastal port cities and established 15 economic and technological development zones in these cities. This involved two

cities in Jiangsu (Nantong and Lianyunguang) and two cities in Guangdong (Guangzhou and Zhanjiang). Thus, most of the development zone PEIAs in Jiangsu and Guangdong are influenced by the foundation of the development zone rooted in history. Restricted by the limited land resources, the land density of Guangzhou and Jiangsu economic development zones is much higher than the western region. It is common for one industrial park to have several mixed and small plots of lands for industrial and residential usage, mixed old heavy pollution industries and resource intensive industries and new high technology and environmental friendly industries and conflicts between the existing concentrated industries and desires of a high quality environment of indigenous residences, which are the challenges that need to be considered in the PEIA process.

One example is the development planning and PEIA of Xinzha industrial park, the Bell Tower economic development zone that is located in Changzhou, Jiangsu and ranged 151 thousand square kilometers in the year of 2010 (Zhang et al., 2010). Since the beginning of the 1950s, the municipal government has invested in the construction of a large number of chemical fertilizer, metallurgy and machinery and power transmission and distribution enterprises. From the 1970s to the 1990s, the region was influenced by becoming one of the cradles of Chinese township enterprises and formed the industrial economy based on the rural villages. Along with the flourishing of township enterprises in this period, many small and medium-sized enterprises, such as the Changzhou gas plants, cotton factories and bricks and tiles plants, were constructed. In the year of 2002, the local government

agreed to set up the industrial park at the district level. Then it upgraded to a city level and province level economic zone in 2003 and 2006, respectively. The PEIA of regional development planning carried out in 2010 faced serious issues, such as the mixed residential and industrial areas and heavy pollution caused by polluting industries constructed early.

In addition, some development zones have a long development time and have carried out EIA several times during the process of relocation, expanding and changing the industries. For example, Taihu basin economic development zone was founded in 1990. It has experienced the process from country level development zone, provincial level development zone to state-level development zone. After founding, it carried out PEIA three times.

On the other hand, one significant characteristic in the western region is low land density. The industrial parks and industrial zones are always built in the scarcely populated rural area. Instead of reforming, rebuilding or upgrading the development zones, a large number of the development zones and industrial parks in the western regions were built, or moved to, the periphery of urban central. The government expropriates land from farmers that is located at the urban periphery and sells the using rate to enterprises, thus the plans always involve a lesser amount of indigenous residence than the eastern region. The education level and environmental awareness of them are low in general. One case is the Hongsipu development zone that was constructed in 1991 in Ningxia. The development zone was built to arrange the ecological immigration from poor households living in

seven poverty countries, named Tongxin, Haiyuan, Yuanzhou, Pengyang, Longde, Jingyuan and Xiji, and to stimulate the second and third industrials suitable for therural migrators. More than 80% of the residents of the areas moved in after 2000. Until 2010, the secondary and third industries occupied more than 48% of all the local economy.

5.1.4 Research organization

1) The organization of interviewees

Since there are four cases in this research, a total of 32 interviews are selected for the research, with eight in each province. The interviewees are selected according to position, level of expertise, experiences and their availability to be interviewed. The sample covers SEA experts from SEA institutes, university professors, directors and vice-directors from EPB/EPO and SEA institutes, registered EIA engineers and the public who have had experiences with SEA, are keen on SEA or have direct connection with development zone planning programs (see the following table). The number of interviewees is designed according to the local circumstances. For instance, there is no top university in Qinghai and there is only one university in Ningxia teaching environmental science, thus there is no university professor and only one university professor selected in the research, respectively.

Tab.5-3. The information of interviewees

Case	Interviewee	Age	Position	Working years in environment field	Date

Qinghai	G-Q-1	50-60	High position in city level EBP	More than 30 years	9.12 & 9.17
	G-Q-2	40-50	High position in city level EBP	20-30 years	9.12 & 9.17
	G-Q-3	40-50	High position in provincial level EBP	20-30 years	9.13
	E-Q-1	40-50	High position in EIA institution	20-30 years	9.14
	E-Q-2	30-40	High position in EIA institution	10-20 years	9.14
	E-Q-3	25-30	Staffs of EIA institutions	5-10 years	9.15
	E-Q-4	30-40	Staffs of EIA engineering	10-20 years	9.16
	P-Q-1	40-50	Public engaged in PEIA	-	9.16
Ningxia	G-N-1	50-60	High position in provincial EBP	10-20years	9.19
	G-N-2	40-50	High position in provincial EBP	20-30 years	9.19
	G-N-3	50-60	High position in city level EBP	5-10 years	9.20
	E-N-1	40-50	High position in EIA institution	20-30 years	9.22 and 9.23
	E-N-2	25-30	Staffs of EIA institutions	5-10 years	9.22
	E-N-3	25-30	Staffs of EIA institutions	5-10 years	9.22
	I-N-1	50+	High position in committee of provincial level industry park	-	9.23
	U-N-1	40-50	University professor	20-30 years	9.23
Jiangsu	U-J-1	40-50	University professor	20-30 years	9.26
	U-J-2	30-40	University professor	20-30 years	9.27
	I-J-1	30-40	High position in the committee of one industry park	-	9.29
	G-J-1	50-60	High position in city	More than 30 years	9.28

			level EBP		
	G-J-2	50-60	High position in district level EBO	20-30 years	9.30
	E-J-1	30-40	High position in EIA institutions	10-20 years	9.27
	E-J-2	25-30	High position in EIA institutions	5-10 years	9.28
	E-J-3	30-40	General staffs of EIA institutions	5-10 years	9.30
Guangdong	U-G-1	50-60	University professor	More than 30 years	10.8
	U-G-2	50-60	University professor	More than 30 years	10.10
	U-G-3	40-50	High position in city level EBP	20-30 years	10.8
	G-G-1	40-50	General Staffs in city level EBP	20-30 years	10.9
	G-G-2	30-40	High position staff in city level EBP	10-20 years	10.11
	E-G-1	40-50	High position in EIA institutions	20-30 years	10.8
	E-G-2	25-30	Staffs of EIA institutions	5-10 years	10.11
	I-G-1	40-50	High position in committee of one industry park	-	10.10

Qing for Qinghai, N for Ningxia, J for Jiangsu and G for Guangdong

G for government, E for EIA institution, I for industry park, P for public, U for university

Resource: Author drawn

Prior to the interviews, around one fifth of the emails were sent to the selected government officers and experts, according to the email information provided on the official website, to seek their willingness to attend the interviews and positive feedback was received from eleven. The other interviewees were contacted through personal connection. Family members and friends contributed to the process of contacting some interviewees. The university professors and key experts in the relative fields, whom I knew very well, also helped me to contact some

interviewees. The research participants were contacted prior to contributing to the contact with more interviewees.

2) The interview questions

The interview questions cover four aspects: the range of SEA; the process of SEA; the public participation; and the administrative power of EPB/ EPO and negotiation of government. The same questions could be asked in different ways. Each interview will last at least one hour and for more information, some interviewees were contacted more than once. A list of interview questions are provided but the interviewees are free to talk their view of points according to the range of interview question.

a) The range of SEA

Considering alternatives or "zero" plans

Are alternatives or "zero" plans considered in the SEA process?

When, and how, are they processed?

(What do you think about considering alternatives in your provinces?)

In the specific development zone PEIA:

How many alternatives were considered in the SEA evaluation process?

When were they put forward?

Who put forward the alternatives (construction companies, SEA institutions, the planning board or local government)?

Post-evaluation

Was post-evaluation implemented in the industrial park PEIA?

When, and how, was it processed?

(What do you think about the post-evaluation in your provinces?)

b) The process of SEA

i. Process

What is the whole process of the SEA in the (specific) development zone planning or industrial parks planning?

What did you do from the acceptance of the SEA work to when the EIS was approved?

How is the open tender organized? (When? How? How many institutions participate in the tender bidding?)

When did it start?

Who was involved?

Who had contact with you, and when?

What did they say?

How long did the SEA process take?

How was it implemented?

How many steps were included? (How many meetings did you have?)

ii. Ability

Do you think the local policy and regulations are helpful (perfect) to make up for the imperfection of the state EIA policy (or to increase the operability and guidance)?

Do you think the staff in the SEA institutions has sufficient knowledge and

technological skills to evaluate the environmental impact in your provinces?

Do you think your institutions or provinces have enough technological staff?

What are the problems faced in your institution in terms of the ability of the staff or facilities?

c) The negotiation of government

i. The attitudes of government leaders

Do you think the SEA practices (process, effectiveness or implementation) are influenced by government leaders?

Are there any examples?

ii. The role and voices of the EPB/EPO at the negotiation process

What do you think about the relationship between the EPB and other government departments?

(Is the EPB less important and does it have fewer voices than other departments?)

Can the advices of the EPB be carefully considered?

(In which ways are the result of the SEA and the advices of the EPB accepted by other departments during the negotiation between government departments?)

Are there any examples?

Has the EPB, or SEA institution, received any pressure from the local government or other departments ?

(During the negotiation process, do you think the result of the SEA could be changed by pressure from other departments or is it pre-established before the

evaluation?)

d) Public participation

What are the main forms of the public participation in the SEA process of your provinces?

Who are involved？When are they involved？

How many advices are collected by public participation?

Are these advices useful to the SEA process (does the SEA process carefully consider the voices of the general public)?

What are the issues (advantages) relating to the public participation practices of the SEA in your provinces?

In the specific development zone PEIA：

How did your institution organize the public participation? (What forms, how, how many times, what time period?)

How many people were involved？Who are the people？How many advices were collected？

What did you do with the advices of the public?Did you give the public feedback or inform them of the adjustment plan?

What do you think about the public participation in the development zone PEIA?

5.2 The dual policies and regulations of environmental

management

5.2.1 The "dual" national strategies: Thirteenth five-year plan

The gap in economic and social development leads to the different development strategies of regions. The five-year plan, also referred to as the "Five-Year Plan for Economic and Social Development", can be considered as a guide for development to ensure the main tasks of the work of the government, to make clear the principles and goals and to lay out the blueprint for future development and is a long-term plan for national economic and social development. As well as the national five-year plans, different provinces in China, according to the local development circumstances, also produced provincial level five-year plans to detail their social and economic development goals and directions in the following years. On reviewing the thirteenth five-year plan (2016 to 2020) of four provinces, and especially the environmental protection and ecological development sections, the gaps existing between the four case provinces are obvious. One similarity is that all of the four provinces produced their five-year plan according to the national "five development ideas" and "six insistences", which emphasize "green development" and can achieve "civilization development with high economic development, rich life and high quality ecology".

1) Principle

In terms of principle, Qinghai mentioned that its development principle is consistent with the central government. Ningxia emphasized pursuing scientific

development and argued that development remains its first task and that the province must aim at the goal of building a well-off society in an all-round way, ensuring that the development of this is a priority task. Unlike scientific development, Jiangsu places high attention on sustainable development and emphasizes green development and green benefits for citizens, promotes greening of the patterns of production, living and consumption and forms a new pattern of human and nature harmonious development, adapts to and guides a new norm of economic development and pays more attention to the "ten ideas", including people oriented development, coordinated development of the region, a balance between economic and social development and environmental and resource spatial distribution, protection of the ecological environment and the formation of green production and consumption patterns. Guangdong emphasizes "three directions and two pioneers" and ensures that it becomes a vanguard of deeply implementing economic reform and opening up, exploring scientific development and striving for its first comprehensive well-off society and modernization. The development strategy pays attention to creative, coordinative, green, open and shared development ideas, insistence of green development, pursuit of green and sustainable development and adhering to resources conservation, environmental protection and sustainable development, accelerating the construction of a resource-saving and environment-friendly society and constructing green homes.

2) The main energy strategy

Largely based on coal energy and full of coal resources, Ningxia plans to adjust and optimize its coal production structure, push a clean and efficient development of coal-fired power and comprehensively implement an ultra low emission reconstruction project for coal-fired power plants. In Qinghai the main strategy is to improve the energy supply and security level. As the water base of the country, the province emphasizes the speeding up of key hydropower stations and new energy projects construction and builds important energy source areas in the country, including the Yellow River million kilowatt water, light and wind complementary power generation bases and the western province million kilowatts of photovoltaic thermal power generation bases. Facing low-level infrastructure development and increasing rural power grid upgrading and transformation to achieve a full coverage of power grid to key towns and key villages is the aim of the energy strategy. With the transferring of the western electricity to the eastern strategy, both Ningxia and Qinghai promote the planning and construction of the high voltage power grid of the provinces in central and eastern China.

The energy strategy in Jiangsu is to construct a low carbon, safe and high efficiency modern energy system and promote energy revaluation. This includes promoting an energy production structure and safe development of nuclear power, vigorously developing wind, solar, biomass and other types of renewable energy and promoting clean and efficient, low carbon and high quality energy to gradually become the main contributor of incremental energy resources. Similar to Jiangsu, Guangdong aims to construct a low carbon, safe and high efficiency modern energy

system, vigorously develop clean energy and develop wind and solar energy storage, solar photovoltaic power generation and geothermal energy. Furthermore, in facing a high population density and to improve the living standards of their residents, the provinces also focus on improving the power distribution, optimizing the structure of the power grid, producing a rational plan for the provinces' power plant construction, promoting the construction of a smart grid and distributed energy systems and strengthening the natural gas, oil, coal and other energy reserves

3) Development of a circular and low carbon economy

Ningxia province places emphasis on constructing a national new energy comprehensive demonstration area, developing a new energy equipment manufacturing industry, creating a whole photovoltaic industry chain and formulating the agglomeration effects and promoting multi-field applications of wind, solar, biomass and other clean energy intensive exploration to develop a low carbon economy. In addition, it promotes a change to the residents' living pattern, such as placing high priority on the development of urban public transport and introducing a guide to "green" travel. As well as Ningxia, Qinghai also plans to speed up the construction of a circular industrial system, extend the industrial chain and improve its utilization system of renewable resources. It also promotes implementation of a produce responsibility of recycling and strengthening kitchen waste recycling and harmless treatment, as well as perfecting the recycling utilization of resources system. Mainly depending on its first industries, Qinghai

also plans to promote the recycling of the agricultural industry,

Unlike Qinghai and Ningxia, Jiangsu and Guangdong in the east have more detailed and operable plans and mechanisms. For example, Jiangsu places high priority on constructing a number of bases for comprehensively using industrial waste, fostering a number of large-scale remanufacturing enterprises, promoting broad-scale use of renewable resources, vigorously developing a low carbon economy, promoting a low carbon product certification system with extensive usage, promoting industrialization of low carbon technology and creating Yangzhong and other near zero carbon emission pilot areas. Guangdong will establish the province's carbon emissions control decomposition implementation mechanism and carry out a carbon intensity annual target responsibility evaluation and assessment. The Pearl River Delta region, to implement the near zero carbon emission zone demonstration projects, will be created as the pilot area. In addition, an application and innovation of energy saving and low carbon technology will be encouraged to strengthen the industrial, construction, transportation and other key areas of energy saving and emission reduction, based on its technology and social development standards.

4) Environmental protection target

The environmental protection target in Ningxia includes: (1) a forest coverage rate reaching more than 15.8%, reducing the per 10 thousand Yuan GDP energy

consumption to 15%[3] and controlling the amount of major pollutants emission in the state standards; (2) initially establishing an ecological compensation mechanism and continually improving the residents' living environment; (3) ensuring that all the coal-fired power plant engines that conform to the transformation conditions achieve emission standards. The average coal consumption per kilowatt should be less than 310g in the existing power plants and less than 300g in the new built power plants. In the mountain regions a gas connection should be archived; (4) at least a forest leisure park and voluntary tree-planting base should be built in each city and county. The Qinghai government emphasize complying with the standards and requirements of the state, ensuring the building of a moderately prosperous society to synchronize with the country, constructing the country's ecological security protective screen, transferring the production pattern, constructing a circular economy development zone, improving the residents' living standards and constructing an advanced district of national unity and harmony. It emphasizes (1) fully implementing the requirements of the nation and province, strictly controlling the development of prohibited zones, limiting the development zones and making progress in ecological protection and environmental quality improvement; (2) initially establishing a resource recycling system and initially forming institutional mechanisms; (3) a comprehensive utilization rate of industrial solid waste reaching above 60%; (4) ensuring that the

[3]People's Republic of China national economic and social development five thirteenth year plan published, March 2016.

percentage of the centralized drinking water sources in towns and the water in areas above town level reach a quality standard of higher than 95%, the rural centralized water supply rate reaches 80% and (5) more than 90% of all the towns and villages and key religious sites have an effectively concentrated treatment of waste. It is obvious that both Qinghai and Ningxia focus more on following the national standards, try to achieve development at the state level and initially establish an ecological compensation mechanism and resource recycling system. Ningxia still emphasizes increasing the using rate of coal energy and the forest coverage rate and Qinghai pays attention to infrastructure construction, such as water quality, supply rate and a waste treatment system.

In Guangdong and Jiangsu, the environmental target is much more advanced. The environmental target of Guangzhou is to, basically, completely form a new pattern of green and low carbon development and controlling the total energy consumption and gross carbon dioxide emission per unit of GDP and major pollutants remains at the forefront in the whole country. The urban centralized drinking water source water quality standards and the overall quality of air reach high standards at the whole country level. Also, Jiangsu underlines obviously improving the ecological quality and leveling up of the green production, living patterns and low carbon standards. The resource development and utilization efficiency will increase significantly, the total discharge of major pollutants will significantly reduce and the environmental risk prevention system will become more perfect. Some of the detailed targets of Jiangsu include decreasing the per

GDP construction land use by 27%, decreasing the CO2 emissions of the per unit industrial added value by 19% and decreasing the main pollutant emissions by 10%, as well as ensuring that the percentage of the centralized drinking water sources water quality reaches higher than 98%, or is better than the Class III ratio, more than 89% of the cultivated land satisfies the soil environment quality standard (the standard is 85% in Qinghai), the energy consumption of the per unit industrial added value decreases by 18%, the comprehensive utilization rate of the industrial solid waste reaches 95% (the number is 60% in Qinghai) and the re-use rate of the urban regeneration resources reaches 80%.

5) Environmental management

One of the most significant gaps in the four provinces is their environmental management. The Ningxia government mentioned increasing the intensity of their environmental management by a strict implementation of a new environmental law and a strict implementation of environmental air quality standards. Although Qinghai in the western region has one of the lowest economic and social development standards, it acts as an ecological shelter zone and directly relates to the ecological security of the country, especially the Sanjiangyuan Area, which is the birthplace of the three Chinese main rivers, namely the Yangtze River, Yellow River and Lancang River. Theenvironmental management strategy of Qinghai is strongly based on the “overall plan for the reform of the ecological civilization system” published by the State Council in September 2015, such as its perfect property right system of natural resources, including the establishment of a unified

registration system of water, forests, mountains, grasslands, wasteland and natural space and clear ownership, the use of rights and the rights of income, etc. and improvement to the paid use of resources and the ecological compensation system (to accelerate the reform of natural resources and product prices and incorporate the resource owners' rights and environmental damage into the price system). Qinghai integrates the government officials' performance evaluation and accountability mechanism and the GDP assessment will not be included in the performance evaluation of the Sanjiangyuan areas. It will also start to study and formulate the green development index system and improve the weight of the green development index. At the city and county level it will carry out a statement of natural resource assets and liabilities pilot and implement an audit of the natural resources assets and cultivated land before the leaving of government leaders. However, there remains no clear target or detailed implementation process of ecological management.

In the following five years, Jiangsu plans to improve its ecological civilization mechanism system and toimprove its regulation and standards system, including speeding up the making and revision of soil pollution permits and laws and regulations relative to the water resources and rivers and lakes protection, wetland protection and environmental monitoring, etc. and reviewing the "Jiangsu Environmental Protection Ordinance" and the "Jiangsu Province Marine Environmental Protection Regulations", etc. In addition, it will also strengthen its environmental law enforcement and supervision and perfect its mechanism of

ecological protection and the role of the market in ecological protection, which are not mentioned in either Ningxia or Qinghai. In terms of improving its performance evaluation and accountability mechanism, Jiangsu also plans to implement a differentiated assessment system and to explore an abolition of the GDP assessment in the regional and ecological sensitive areas to limit its development. It will gradually carry out an audit of its natural resources before the leaving of government leaders and will form an environmental protection responsibility system. More advanced, Guangdong will reform its performance evaluation and assessment mechanism and systematically integrate its resource consumption, environmental damage and ecological efficiency indicators into the government assessment system and establish an ecological environmental damage accountability system. In addition, it will strengthen the role of its market and establish, and improve, the right of using energy, the right to use water and the emission rights' and carbon emission rights' initial allocation system. It will actively conduct an emission and water using rights trading pilot, improve its carbon emissions management and trading system and strive to establish a regional carbon trading market. Also, the province will reform its environmental management system, establish a strict supervision management system of all the pollutants' emissions and improve its inter-regional environmental pollution control and management.

6) Others

There are also some specific characteristics of Jiangsu and Guangdong in the

eastern regions, in terms of trans-boundary and cross-region environmental protection and a green lifestyle and green products. To strengthen the river pollution control, especially the trans-boundary rivers, to promote a comprehensive management of air pollution and to implement regional joint prevention and control are put forward in the five-year plan of Guagndong, Other factors include exploration of the pilot region to promote carbon GSP, which is a system that allows small and micro enterprises, families and individuals to receive carbon money by decreasing their carbon emission in exchange for gifts, and strengthening the promotion and application of green low carbon products, to improve its proportion of the market share and to become listed in the government's priority procurement directory. The Jiangsu government also encourages buying green products.

5.2.2 Industrial transfer strategy and China Western Development

The Western Development Strategy is one of the main strategies of the state and aims to improve the economic and social development of the western region and to consolidate the national defense by using the surplus economic development ability of the eastern areas. China implements "western development for the purpose of narrowing the gap between the eastern region, which is more developed and has more economic development ability and redundant resources, and the western region by transferring some eastern industries to the western region, to ensure a steady, rapid and healthy overall economic level in China". It fully plays

to the comparative advantages among the regions and deeply implements the advantages of the western region relating to low resources and labor prices to "promote the co-operation and division of labor among different regions, encourage the rational flow of production factors in the power market and the benign interaction between the developed regions and underdeveloped regions, in order to gradually find the best path to narrow the gap in regional development"[4], which has been mentioned in the national social and economic development five-year plans. Some corresponding policies have also been enacted. For example, the construction land-planning index of the state includes the western areas, according to the Ministry of Land and Resources (MLR). Inside the document named "The Great Western Development Land Use Planning Outline", MLR emphasizes (1) the priority to arrange and ensure the key infrastructure construction project on land use (2) to implement a low land price policy for key development industries and (3) to implement a differentiated land policy (Gao et al., 2013)

Even though the Western Development Strategy encourages the national preferential policies and investment is inclined to favor the west region and leads to a significant development of the economy, education, transport and other infrastructures, its negative influences on the environment have been obvious. In general, the disadvantages of the Western Development Strategy relating to environmental protection include a high polluting industry transfer, the increasing

[4]China Twelfth Five-Year Plan

of the energy consumption of the western region and strengthening the idea of economic development and a GDP increase of the local government.

Firstly, the gap existing between western and eastern China in relation to income and development is similar to the gap between the developed and undeveloped countries. The duality in China in economic development makes China face similar issues. “In order to ensure a competitive advantage, the coastal and advanced areas will inevitably put products research, development and sales into local areas, while transferring their products that lack a comparative advantage, have a high environmental cost and are located in the relatively low-end of the industrial link to the undeveloped west” (Deng, 2009). In the undeveloped middle and west, those industries are not only labor-intensive industries, but are also pollution-intensive industries. In this sense, following the rules of trade, the high energy consuming industries and polluting industries will gradually shift to the west. “We have to see, since the clean energy still cannot meet the desire of high rapid economic development in China in the short time; the fact is that the demands of traditional energy in the west are increasing and high energy consuming industries shift to the west”(Lin, 2014). Western China has a broader economic development space, abundant resources, relatively low labor prices and cost of the environment. “If the overall pollution cannot be avoided in China, comparing it with the eastern part, the cost of environmental pollution is much lower” (Lin, 2014). Shanghai, for example, achieved thousands of labor intensive and traditional industries transferring to the outside, because of the success in applying for and holding the World EXPO in the

year 2000 (Jiang, 2013).

Based on the national development strategy, for the eastern regions, the most significant work was, on one hand, to improve the standard of economic openness and marketization and to continually transfer from global scale processing, manufacturing and assembling zones to technology research and development, advanced manufacturing and modern service industry zones, while, on the other hand, the undeveloped areas, especially the western areas, had to use their relative advantages of resources and labor resources and to undertake industrial transformation from the eastern regions and developed global areas. According to the statistics, currently, the industrial transfer from the eastern regions to the western regions still inherits the basic characteristics of the international industrial transfer that is "dominated by secondary industry and have the trend of third industry" (Jiang, 2013). Even though there were almost 20 industrial transfers from the eastern to the western areas, there slowly appeared some high-tech industries, such as the electronic industry and circular economy industry. The industrial transfer is still dominated by machinery, toys, instruments and plastic and food industries and traditional manufacturing (Jiang, 2013). As claimed by Kang (2002), the environmental problems in the west, in addition to natural factors, are the irrational human factors, which are more important. Wei and Bi (2011) researched the data of the manufacturing industries of the National Economical Industry Classification from 1998 and found most of them had been transferred from the eastern to the western regions from 2004. The 19 industries that had significant

industrial transformation are shown in the following table. Nine industries are heavy pollution industries and ten industries are relatively mild pollution industries.

Tab.5-4. The classification of 19 transferred industries, according to the density of pollution

Heavy-pollution industries	Light-pollution industry
Agricultural and sideline food processing industry	Textile clothing and footwear industry
Food manufacturing industry	Leather fur feather and its products industry
Beverage manufacturing industry	Furniture manufacturing industry
Textile industry	Printing and recording media reproduction
Wood processing and bamboo, rattan, palm grass products industry	Stationery and sporting goods manufacturing industry
Paper and paper products industry	Rubber products industry
Pharmaceutical manufacturing industry	Plastic products industry
Non-metallic mineral products industry	Metal products industry
Non-ferrous metal smelting and rolling processing industry	Special equipment manufacturing industry
	Electrical machinery and equipment manufacturing industry

Resource: Wei and Bi (2011)

Environmental pollution transfer has been happening in China in recent years (Cui, 2015). According to international experiences, the success of environmental management in the developed countries is always at the expense of increasing the pollution of the developing countries, thus carrying out pollution transfer through trade and capital investment. Similarly, it is possible that the undeveloped west and middle region pay for the environmental management of the east. The east may transfer their intensely polluting enterprises through trade and capital investment.

Therefore, the trend of more pollution in the west and middle regions seems inevitable.

Recently, the middle region of China has become a national important economic growth plate and has undertaken industrial transfer from the east (Li and Xu, 2013). However, with the rapid growth of the economy, a series of environmental problems, such as air pollution, has emerged. According to the 2011 China's urban air index ranking, the cities in the middle region ranked at the top among the 120 cities, in accordance with the degree of pollution from heavy to light, and most of them ranked between ten to twenty-eight (Li and Xu, 2013). Even though the government has adopted some more stringent environmental protection measures, the total amount of the emissions of many pollutants is still continuing to increase with the economic development (Xie, 2010). For example, although prior to the implementation of the China Western Development strategy, the State Environmental Protection Administration (NEPA) and the State Economic and Trade Commission (SETC) jointly issued a document to forbid the polluting enterprises to transfer to the western region by taking the opportunity of this strategy. However, research performed in Inner Mongolia indicated that, in Wuhai city, Alashan and Ordos City, some enterprises with serious pollution came into the western part and settled in succession (Jiang and Zhou, 2003).

In addition, the economic development and urbanization unavoidably increase the need for resources. However, the western region has a more fragmented environmental system and less knowledge and ability of environmental

management and protection. Furthermore, although a large number of landmark projects have been completed, such as the West-East natural gas transmission project, West-East electricity transmission project and Qinghai Tibet railway, the study found that no major breakthroughs have been made, in terms of the number and scale of enterprises in the central and western regions, the construction of industrial clusters, market awareness and the degree of market development (Li and Liu, 2011). On one hand, the energy projects, such as the West-East electricity transmission project and West-East coal transmission project, decrease the dependence on small size thermal power satiation (Song, Chen and Liu, 2005). On the other hand, however, the main power supply in China is still based on thermal power, as well as the western region, even though hydroelectricity is encouraged in the strategy. For example, Ningxia has the duty of transferring thermal power to the sending terminal power grids of the northwest and to transfer to Beijing, Hebei and Shandong (Zhou, 2003). At the same time of decreasing the environmental pollution and improving the energy security of the eastern region, the western region has to have the reasonability of increasing its resource exploration and power supply in its more pollutant sensitive environment and fragmented ecological system.

Furthermore, the main aim of the China Western Development Strategy is to develop the economy. A GDP increase has become the main expected result and goal of the local government. The West Development Strategy strengthens the idea of taking economic development and a GDP increase as its first task. Local

government leaders pursue a high economic development speed and ignore the environmental capacity and environmental impacts of projects to improve their personal performance. “Some local governments misunderstand the strategy and blindly introduce outside investment. In one of the western provinces the government even made “four regardless policies”, being that: “regardless of what enterprise it is, it is acceptable if it can promote local economic development; regardless of being a state-owned or private-own enterprise, it is acceptable if it is able to pay taxes to the government; regardless of the size of the enterprise, it is acceptable if it can increase the employment rate; and regardless of being a national or foreign capital enterprise, it is acceptable if it can bring benefits to local development” (Han, 2011). Under the background of the China Western Development Strategy, local governments have strong motivation to achieve economic development and are more inclined to sacrifice the environment for GDP growth.

5.2.3 The duality environmental policies and regulations

1) Environmental Protection Ordinances

The PRC Environmental Protection Law enacted in 1989 contains 47 articles. After being reviewed eight times, the new environmental protection law implemented on 1st January 2015 increased to 70 articles and was stated as the “most serious law relative to environmental protection in China” and “one of the most complete environmental protection laws in the world” by the deputy director of the State

Council Development Research Center of Resources and Environmental Policy Research Institute, Chang Jiwen (Dongan EPO, 2015).

The local environmental protection ordinances complement the national environmental protection law. Encouraged by the national environmental protection law, the provinces promulgated local environmental protection regulations and created more detailed rules, according to the local circumstances. Of the four case provinces, three of them, Jiangsu and Guangdong in the southern region and Ningxia in the western region, have local environmental protection ordinances and the other, Qinghai in western China, has not published any provincial level environmental ordinances. Instead, the Qinghai government has enacted the Xining, the capital city, environmental protection ordinance.

The Jiangsu environmental protection ordinance was passed in 1993, was adjusted in 1997 and contains 51 articles. Promulgation of the reviewing version of the Jiangsu environmental protection ordinance was written by the Jiangsu provinces government during the 13th five-year working plan. Ningxia's first environmental protection ordinance was adjusted in 2009 and includes 54 articles. The Guangdong environmental protection ordinance was passed several days later than the implementation of the new environmental protection law in 2015, includes 83 articles and is one of the earliest reviews of environmental protection ordinance after the new environmental protection law. The Xining environmental protection ordinance published on 24 November 2011 includes 56 articles. As the local ordinance should be subordinate to the national law, the differences between the

ordinances and the law will not be discussed here. The author only describes the added and detailed rules mentioned in the local ordinances, in terms of the aims of legislation and legal duty.

Regarding the aims and what they consist of,there are six chapters dedicated to the national environmental protection law: general provisions, supervision and management, protecting and improving the environment, preventing pollution and public nuisance incidents, information on open and public participation and legal duty. Only Guangdong is included in the information on open and public participation chapter in this local ordinance. In addition, Guangdong also has an additional chapter relating to environmental protection economic policies, such as the policy to "build environmental protection investment and a financing mechanism and to encourage social funds to be invested into the environmental protection industry", the policy that the "provincial should encourage an ecological incentive financial mechanism" and the policy of "paid use and a trade system of emission rights".

The aims of the environmental law mentioned are to "protect and improve the environment, prevent pollution and other nuisances, protect the health of the public and promote the construction of ecological civilization and the sustainable development of the economy and society". The Ningxia environmental protection ordinance published five years earlier also mentions promoting sustainable development and protecting and improving the "living and ecological environment", whilst achieving ecological civilization, protecting public health and

preventing pollution nuisances are not included. Implemented 18 years earlier, the Jiangsu environmental protection ordinance did not mention sustainable development, but includes protecting and improving the living and ecological environment, protecting the health of the public and preventing pollution and other nuisances. In the Guangdong environmental protection ordinance the aim of constructing an ecological civilization is included.

Regarding the aspect of legal duty,there are 9 articles in the national laws, 18 articles in Guangdong, 10 articles in Jiangsu and 8 articles in Ningxia. A most significant change to the new environmental protection law, being a serious article that states that enterprises and departments illegally discharging pollutants are punished by a fine, was required to make a correction. This could not be adjusted and was consecutively published according to the original daily penalty. This means that, if one enterprise was charged 200,000 Yuan for illegally discharging waste water, it would be forced to adjust its waste water system until 1st January. The enterprise would be charged 200,000 Yuan for 1st January and would be charged 400,000 Yuan if it did not adjust to the new system on 2nd January and then charged 600,000 on 3rd January. It mentioned the legal duty of the “environmental protection management departments (EPB/EPO) and that the departments are responsible for environmental protection supervision” and listed nine types of misbehavior, such as “granting an administrative license to projects that do not conform to the administrative licensing conditions” and do not “protect the environmental violations”. In addition, the environmental protection law stated, for

the first time, that the government departments, or responsible people, who do not make open the environmental information required by law, must be punished by law.

Even though it was published in the late 1990s, the Jiangsu policy has a clear and detailed list of illegal behaviors and includes 14 misbehaviors relating to the implementation of the main environmental protection polices in China, such as the EIA, pollution charge and "design and construction, and use at the same time". Examples of articles include "the violation of the system of environmental impact assessment" and "the error conclusion of environmental impact assessment and leading the cost". The Guangdong environmental protection ordinance expands on the coverage of the government responsibility, from an environmental management and supervision department to other relative departments. The liable person, and others directly liable, shall be punished "if they do not integrate environmental protection work into the local economic and social development plans and programs, do not make local government or department environmental protection targets" and "do not implement environmental protection plans". The environmental protection ordinance requires that the decision-makers have to combine economic and social development with environmental protection and accord with the aims of sustainable development and SEA. In addition, the misbehavior of liable people towards emergent environmental incidents, environmental monitoring and environmental statistics should also be punished. This covers: "do not make and open an emergency response plan of environmental

incidents according to the regulation or deal with environmental incidents according to the local emergency response plan", "delete or change the environmental quality monitoring point (section)" and "do not engage in environmental monitoring activities according to monitoring regulations" or "make, change, fake, submit late or refuse to submit environmental statistics data."

In contrast, the Ningxia environmental protection ordinance includes only two illustrations about the legal duty of government environmental protection and supervising departments and other government departments, such as the "people's government fails to perform its duties resulting in a decline in environmental quality and significant environmental problems that are not addressed in the long term" and "environmental protection development and the relevant supervision and administration departments carry out supervision and management responsibilities or duties ineffectively", which are very general and difficult to operate and evaluate. The four types of misbehavior of the government department person in charge also only cover general issues, such as misfeasance in working or government action inaction and lack of detailed rules.

Regarding the aspect of imposing fines for illegal behavior, the punishment strength differs among regions. The national law does not include details of the penalty. Taking the implementation of EIA as an example, in the Ningxia and Jiangsu environmental protection ordinances the penalty for a project that did not submit the EIA before construction and submitted supplementary documents was not mentioned.

On one hand, in the Xining environmental protection ordinance, for the construction projects that did not resubmit the EIA document in the required time, the fine charged is from 10,000 Yuan to 100,000 Yuan. On the other hand, in Guangdong, for the construction projects that start their construction without submitting approved EIA documents, the project owner will be charged from 100,000 to 200,000 Yuan and will have to stop construction and recover the original land shape, even though the projects may resubmit the EIA documents when required to do so, which is much more serious than Xining. Other detailed and serious penalty rules are also included, such as when "environmental monitoring agencies conceal, forge or alter the environmental monitoring data they will be charged from 100,000 to 20,000 Yuan and the directly responsible personnel and other responsible personnel could be charged between 20,000 and 50,000 Yuan".

2) Other ordinances

The number of local ordinances in Qinghai and Ningxia is very limited. There are only two local ordinances in Qinghai (both of them relate to river basin protection) and four in Ningxia, which cover only river basin protection, environmental education and desertification. The existing local environmental laws have been unable to meet the ecological environment protection and social development in the west region (Cui, 2015), which leads to the western region heavily depending on the development of the economy and ignoring the ecological conservation. The existing ordinances mainly relate to pollution prevention and

control, the local law guides ecological conservation and the living and producing of the local residents is rare. Compared with Qinghai and Ningxia in the western region, Jiangsu and Guangdong in the eastern region have a much more mutual environmental ordinance system. 19 and 12 local environmental ordinances have been enacted in Jiangsu and Guangdong, respectively. Their range covers not only natural resources conservation (such as water pollution and solid waste control and management), but also ecological protection and the management of living and industries (such as the protection of agricultural environment and motor vehicle exhaust pollution).

Tab. 5-5. The list of local environmental protection ordinances

Province	Local ordinance	Time
Qinghai	Water pollution Prevention and Control Ordinance in Huangshui River Basin in Qinghai Province	2013.9.27 Passed
	Qinghai Lake Basin Ecological Environment Protection Ordinance	2003.4.17 Passed
Ningxia	The Ningxia Hui Autonomous Region Jinghe Water Basin Reserve Ordinance	2014.4.9 Passed
	The Ningxia Hui Autonomous Region Environmental Education Ordinance	2011.12.1 Passed
	The Ningxia Hui Autonomous Region Desertification Prevention and Control Ordinance	2010.10.15 Passed
	The Ningxia Hui Autonomous Region Environmental Protection Ordinance	2010.1.1 Reviewed
Jiangsu	Jiangsu Province Marine Environment Protection Ordinance	2016.3.30 Reviewed
	The Circular Economy Promotion Ordinance of Jiangsu Province	2015.9.25 Passed

	Ordinance on Prevention and Control of Atmospheric Pollution in Jiangsu Province	2015.2.1 Passed
	Ordinance on the prevention and control of motor vehicle exhaust pollution in Jiangsu Province	2013.11.29 Reviewed
	Ordinance on the Prevention and Control of Motor Vehicle Exhaust Pollution in Jiangsu Province	2013.11.29 Reviewed
	Lake Protection Ordinance of Jiangsu Province	2012.1.12 Reviewed
	Ordinance of Tongyu River Water Pollution Prevention and Control in Jiangsu Province	2012.1.12 Passed
	Ordinance of Jiangsu Province on Fisheries Management	2012.1.12 Reviewed
	Jiangsu Province Inland Waterway Traffic Management Ordinance	2012.1.12 Reviewed
	Ordinance on the Prevention and Control of Environmental Noise Pollution in Jiangsu Province	2012.1.12 Reviewed
	Jiangsu Province on Energy Conservation Ordinance	2010.11.19 Reviewed
	Ordinance on Prevention and Control of Water Pollution in the Yangtze River in Jiangsu Province	2010.9.29 reviewed
	Ordinance of Taihu Water Pollution Prevention and Control in Jiangsu Province	2010.9.29 reviewed
	Ordinance of Jiangsu Province on the Prevention and Control of Solid Waste Pollution	2009.9.23 Passed
	Ordinance of Jiangsu Province on the Prevention and Control of Radiation Pollution	2007.11.30 Passed
	Jiangsu Province Inland Waterway Ship Pollution Prevention and Control Ordinance	2004.6.17 Passed
	Jiangsu Province Agricultural Environment Protection Ordinance	2004.6.17 Reviewed

	Jiangsu Province Mineral Resources Management Ordinance	1999.10.30
	Jiangsu Province Environmental Protection Ordinance	1997.7.31 Reviewed
Guangdong	Ordinance of Guangdong Province on the management of Urban and Rural Waste	2015.9.25 Passed
	Guangdong Province Environmental Protection Ordinance	2015.1.13 Reviewed
	Guangdong Province Drinking Water Source and Water Quality Protection Ordinance	2010.7.23 Reviewed
	Ordinance on the Prevention and Emergency Management of Nuclear Accidents in Civil Nuclear Facilities in Guangdong Province	2010.7.23 Reviewed
	Guangdong Province Dongjiang Water Quality Protection Ordinance	2010.7.23 Reviewed
	Ordinance on the Prevention and Control of Motor Vehicle Exhaust Pollution in Guangdong Province	2010.6.2 Reviewed
	Guangdong Province Cross Administrative Region River Cross-Section Water Quality Management Ordinance	2006.6.1 Passed
	Ordinance on the Environmental Protection Management of Construction Projects in Guangdong Province	2004.7.29 Reviewed
	Ordinance of Guangdong Province on the Prevention and Control of Solid Waste Pollution	2004.1.14 Passed
	Guangdong Hanjiang River Basin Water Quality Protection Ordinance	2001.1.17 Passed
	Guangdong Province Water Quality in the Pearl River Delta Protection Ordinance	1998.11.27 Passed
	Ordinance of Guangdong Province on the Protection of Agricultural Environment	1998.6.1 Passed

Resource: author drawn according to the four province EPB official website.

5.2.4 The dual environmental protection standards

According to the law, provincial governments can make local environmental standards for the items that are not required on the state environmental quality and pollution emission standards or make the local standards more serious than the state standards. In general, the eastern region has more serious environmental protection standards than the western region. In the eastern provinces, they have more serious environmental protection standards, while the western provinces have relatively closed national standards. In addition, some types of pollutant emission are restricted in some eastern regions, whilst they are not restricted in other regions. This leads to the phenomenon of “some provinces pollute the environment while some provinces protect the environment” (Chen, 2015). Taking the ambient air standard as an example, there is no extra ambient air standard in Qinghai province and only one in Ningxia until now, named the “Emission standard of pollutants for coal-based activated carbon industry”. Jiangsu has two standards, such as the “emission limits for exhaust pollutants for a steady state operation of light duty vehicles with spark ignition engines”, and three local standards, such as the “Air pollutant emission standard for lead storage battery industry” (draft for comments), have been published. Guangdong province has enacted 15 ambient air environmental standards, such as the "cement industry air pollutant emission standards".

In addition, the same national environmental standards are only used in some parts of the pilot provinces or cities and most of them are in the eastern regions. For example, in order to strictly control motor vehicle pollution, the state council and MEP agreed to comprehensively implement the new standard of "emission limits and measurement methods of light vehicles (China's fifth phase)" on 1st April, 2016 and this only covered the 11 provinces of the eastern regions (Notice on the implementation of the fifth phase motor vehicle emission standards). The MEP published the “Notice on the implementation of special emission limits for atmospheric pollutants” in 2013, which mentioned the special emission limits of six industries (thermal power, iron and steel, petrochemical, cement, nonferrous metals and chemical industries) in the key control areas. The key control areas cover 47 main cities and include only seven western cities. In Qinghai and Ningxia in the western region, only one capital city, named Yinchuan, is included in the standards, while, in Jiangsu and Qinghai, eight cities and nine cities are included, respectively.

Different regions sometimes use different standards of the same environmental index. This is partly because the different provinces have different pillar industries and different economic and social development standards and the selection and introduction of the industries are suitable for regional development. In order to promote the development of those industries, the provincial government will consider the local economic development when making the environmental standards. One example is three provinces in the Beijing-Tianjin-Hebei economic

region. Beijing is considered as an economic, political and cultural center. Hebei is a supporting and resource base for the regional development. Tianjin plays the role of a transport hub. All three areas published the local “Boiler Air Pollution Emission Standard”. The Beijing industrial gas boiler pollutant emissions limits are: dust 30mg/m3, SO2 50mg/m3 and NOx200mg/m3. In Hebei, the limits of dust, SO2 and NOx emissions are 50 mg/m3, 100 mg/m3 and 400 mg/m3, respectively. As the transport hub and port city, Tianjin is not required to depend on industrial resources as much as the heavily industrial province of Hebei, where the dust, SO2 and NOx emission standards are limited to 10 mg/m3, 20 mg/m3 and 300 mg/m3, respectively. Unlike Jiangsu and Guangdong, Ningxia and Qinghai mainly implement relatively loose national standards and this also reflects their attention to supporting the local industries and making economic development their central task.

5.2.5 The dual environmental protection mechanisms

The environmental management system includes commending and control regulations and market-based incentives (Dong, 2011). The commending and control regulations mainly use the government coercive means of government to manage the producer behaviors and restrict and forbid the emission of some pollutants. The names of the regulations and their implementation time and object can be seen in the table below. “Design, construct and implement at the same time”, which requires environmental protection facilities, and must be designed and constructed at the same time as the construction of the projects or factories and

used at the same time as the production, is China's first environment management regulation, enacted in 1973. The earliest government commending and control regulations also include EIA and were implemented in countries overall. In the years of 1988 and 1989, five new regulations were enacted to make up for the shortage of previous regulations, remove the responsibility of the government and local enterprises and increase the intensity of pollution remediation, and these five regulations were named as the urban environment comprehensive management and control quantitative assessment system, total pollutant load control system, pollutant discharge permit system, pollution centralized control system and pollution deadline governance system. Most of the main environment regulations of this period were commending and control regulations.

1) Command and control (CAC) regulations

It can be seen that, except for the urban environment comprehensive management and control quantitative assessment system that still relates to 32 main cities, all of the other regulations are now implemented in the whole country. In the process of regulation implementations, they are firstly tested in pilot regions. Jiangsu and Guangdong have had much more early practices of environmental protection regulations than Ningxia and Qinghai, which only started the system after the official establishment nationwide. For example, although put forward in 1988 and 1990, respectively, the water pollution and air pollution discharges permit systems' detailed and workable implementation plan was not finally published until November 2016. However, in 1988 and 1994, 18 pilot cities and 16 pilot cities

implemented a water and atmosphere pollution discharge permit system, respectively, including cities in Jiangsu and Guangdong. In 2009, Shenzhen (in Guangdong) published its implementation methods of pollution discharges permit system, covering water, air and noise, and Jiangsu also published its water pollution discharge permit implementation methods in 2011.

Furthermore, the gaps in the environmental protection policies in the western region also reflect the different requirements existing in the same regulations. For example, when making the national total pollutant load control target, according to the different economic development standards and other social development standards, such as the per capita vehicle ownership, the MEP created different total pollutant load control targets towards western, central and eastern China. During the national 11th five-year plan (2005-2010), the eastern provinces had the heavy responsibility of decreasing the total pollutant load. The total amount of the SO2 emission load was required to be decreased by 18% from 2005 to 2010, and 15% in Guangdong (20% in Shenzhen), and the central region had the medium contribution to the total pollution load. The targets in the various western provinces differ. The SO2 emission decreased in Qinghai to zero and in Ningxia to 9.3%, which, in general, is much less than in Jiangsu and Guangdong[5].

2) Market-based Incentives (MBI) regulations

Turning to the market incentive regulations, "pollution discharge fee" is the

[5]The State Council, Plan for major pollutant emission control during the period of 11th Five-Year

earliest market incentive regulation in China and was one of the three main environmental regulations in China until 1989. Unlike the commending and control regulations, most of the market incentive regulations were published later than 1989. In addition, apart from the pollution discharge fee and pollution management subsidies, all of the regulations mentioned above focus only on specific regions and Qinghai and Ningxia are excluded from most of the market incentive systems. In contrast, Jiangsu and Guangdong have become the pilot regions for implementing market-based regulations. Each market-based environmental protection regulation selects either Jiangsu or Guangdong, or both, as a pilot region, including the SO2 emission fee, SO2 emission right trading, ecological compensation pilot, "design, construct and implement at same time" permit fees, SO2 emission right trading and ecological compensation pilot CO2 emission right trading. The CO2 emission right trading system was put forward in only a limited number of regions, such as Beijing, Shanghai and Guangdong, in 2011. In 2013, the Shenzhen CO2 emission rights trading market was started. The western regions, such as Qinghai and Ningxia, do not have a mature market-based economic system and platforms for an emission trading system implementation.

Jiangsu and Guangdong also created local market incentives regulations. For example, Changchu in Jiangsu is the only region in China to implement a management facility operation margin and Guangdong explored the pilot to promote a carbon GSP, which is a system in which small and micro enterprises, families and individuals would receive carbon money by decreasing their carbon

emission (using the public transport, for example) and the carbon money would be used in exchange for gifts. In terms of an investment policy, Jiangsu published the "Jiangsu Province Interim Measure for the Transfer of Ecological Compensation" and "Jiangsu Ecological Red Line Conservation Region Management Interim Measure" in 2013 and provided ecological compensation to the regions implementing ecological red line regional protection. These measures emphasized the idea that "regions contributing more to ecological protection would receive more benefit"[6]. Over one billion Yuan of funds was provided in the year of 2013

Tab.5-6. The environment management systems in China

Methods	Regulations	Time	Object regions	Description
Commending and control regulations	"Design, construct and implement at the same time"	1973	Overall country	
	EIA system	1979	Overall country	
	Urban environment comprehensive management and control quantitative assessment system	1988	32 cities	1988; 21 indictors of five items; 2003 establishment of ecological cities;
	Total pollutant load control system	1988	Overall country	
	Pollutant discharge	Water: 1988	Overall	Water: 1988; 18

[6]Accordingto the Jiangsu Economic Development Bureau

	permit system	Atmosphere: 1990	country	pilot cities; Atmosphere: 1994; 16 pilot cities. including Jiangsu and Guangdong; 2016.11, implementation plan
	Pollution centralized control system	1989	Overall country	
	Pollution deadline governance system	1989	Overall country	1978, first batch; 1989. second batch; 1996, third batch
	Environmental protection target accountability and performance evaluation system	1996	Overall country	1988, Shanxi and Jiangsu pilots
Market-based incentives	"Pollution discharge fee"	1982/2003 reviewed	Overall country	
	Pollution management subsidies	1982	Overall country	
	Pollutant discharge permit trade system (pilots)	1985	Shanghai, Shenyang, Jiangsu, Guangdong	
	"Design, construct and implement at same time" permit fees	1989	Jiangsu, etc.	

	SO2 emission fee (pilots)	1992	Two provinces; 9 cities, including Jiangsu and Guangdong	
	Management facility operation margin	1995	Changshu in Jiangsu	
	Aircraft noise charges (pilots)	1998	Several cites	
	SO2 emission right trading	2002	Shandong, Shanxi, Jiangsu, Henan, Shanghai, Tianjin, Liuzhou	
	Ecological compensation pilot	2001	11 provinces; pilots include Guangdong and Jiangsu	Early practices 1978
	Energy saving products subsidies	2002	Overall country	
	Income preferential tax of enterprises that use special energy and water saving equipment	2008	Overall country	
	CO2 emission right trading	2011	Beijing, Shanghai, Guangdong, etc.	2013, Shenzhen CO2 emission right trading market starts

	Carbon GSP	2015	Guangdong	

Resource:Adjusted according to the MEP official website, Zhao, Zhu and He (2009) and Lan and Guan (2016)

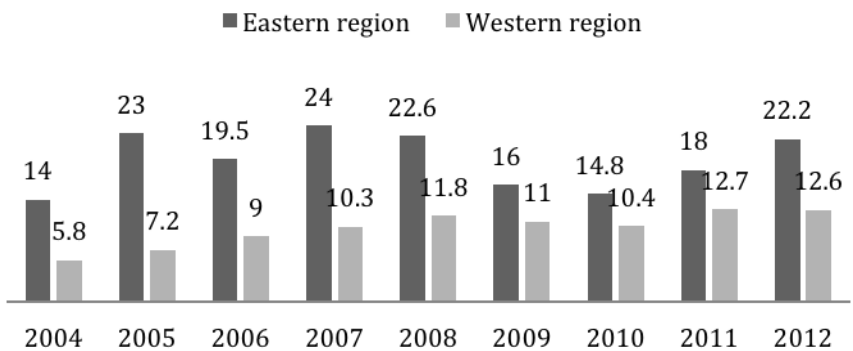
5.2.6 The dual supporting and management policies and regulations

1) Environmental protection investment

China uses a fiscal decentralization policy, which means that the central government gives the local governments tax rights and expenditure rights and the discretion of the size and structure of their budget revenues and expenditures (Zhang, 2014). Although the environmental protection laws and regulations at the state level are suitable for all regions, the local governments have the right to manage their local environmental protection by making environmental policies by investing in the environmental pollution management and environmental protection industry. Thus, the environmental protection investment should reflect the local governments' efforts and determination to solve local environmental issues (Zhang2, 2014). Cui (2015) summarized the amounts of the average investment in industrial pollution control of different regions between 2004 and 2012. The eastern region has a significantly larger amount of local government investment in the pollution control of industries, even though the number in the western region is increasing gradually.

Fig.5-3. Local governments' average industrial pollution control investment in the western and eastern regions between 2004 and 2012.

(Unit: one billion)



Resource: Cui (2015)

Currently, China calculates the investment completed in environmental pollution treatment investment by adding the investment in urban environmental infrastructure facilities, investment in the treatment of industrial pollution sources and environmental protection investment in the environmental components for new construction. However, the environment infrastructure includes items that are not generally considered as environmental protection infrastructure, such as gas supply, central heating, sewerage projects and sanitation, which make the calculation of the environment investment in China larger than the international standard (Dong, 2011). This current paper has selected the investment in the wastewater treatment and garbage treatment of urban environmental infrastructure facilities to calculate the environmental pollution investment.

From the above table, it is easy to see that the investments in the treatment of environmental pollution and improving the environmental ability are significantly

different in the western provinces and the eastern provinces. The total investments in the treatment of environmental pollution are 349.21 billion Yuan and 233.21 billion Yuan in Jiangsu and Guangdong, respectively, and only 18.58 in Qinghai and 54.59 in Ningxia. The amount of the investment in the environmental pollution in Qinghai occupies only 5% of the amount in Jiangsu in the year of 2014. In addition, regarding the investment in improving the environmental protection ability of the areas, including environment monitoring ability, environmental supervisor ability, nuclear and radiation safety supervision ability, solid waste and environmental emergency management ability and environment information and education ability, Guangdong has the largest amount of investment in environmental ability, with the amount being 5.2 billion Yuan in the year of 2014. The Jiangsu government invested 1.24 billion Yuan in improving its environmental ability, while Ningxia and Qinghai invested only 117.40 million Yuan and 417.44 million Yuan, respectively, occupying only 2.3% and 8%, respectively, of the investment in Guangdong. The amount of the investment in solid waste management (0.008 million Yuan) accounted for only 0.02% of the investment amount of Jiangsu province (36.83 million Yuan) and 0.005% of the investment amount of Guangdong (157.60 million Yuan). The investments in environmental education and nuclear and radiation safety supervision in Ningxia and Qinghai are much lower than their eastern counterparts.

Tab.5-8. Investment in the treatment of environmental pollution by region at the end of 2014 (units: one million Yuan)

Item	Total investment in the treatment of environmental pollution	Waste water treatment	Garbage treatment	Investment in treatment of industrial pollution sources	Investment in the environmental components for new construction
Jiangsu	349.21	26.87	21.04	48.5	252.8
Guan	233.21	14	10	37.9	170

gdong		.57	.74		
Qinghai	18.58	3.12	0.46	7.5	7.5
Ningxia	54.59	0.23	0.26	27.3	26.8

Resource: Adjusted according to the China Environmental Yearbook and China 2015, China Environmental Statistic Yearbook and China Urban Construction Statistical Yearbook 2014

Tab.5-9. Environmental protection ability investment in different regions in 2014 (units: one million Yuan)

									ENV operation safeguard

Resource: Adjusted according to the China Environmental Yearbook 2015

Turning to the resources of environmental protection ability, on average, 13% of the resources came from the state. In the eastern region, Jiangsu (1.1%) and Guangdong (8.8%) have a much lower percentage of state investment. In Ningxia and Qinghai, the rates of the state contribution are much higher than the national average, especially in Qinghai, where the state contributed 26% of the environmental protection investment in improving the management ability. Jiangsu province has a much higher town and districts government investment than the national level and other provinces. The number reached 581.68 million Yuan,

occupying 46.9% of the total investment. This results from the relatively average economic development standard among the different regions in Jiangsu and the high economic development level at the towns and districts level.

Tab.5-10. The resource of the environmental protection ability investment in 2014 (units: one million)

Region	State	Percentage	Provincial government	Percentage	City and town government	Percentage	Town and districts government	Percentage
Total	2246.80	13.1%	7575.07	44.1%	3570.1	20.8%	3803.17	22.1%
Jiangsu	13.4	1.1%	346.03	27.9%	300.11	24.2%	581.68	46.9%
Guangdong	458.37	8.8%	3906.36	74.9%	340.68	6.5%	511.71	9.8%
Ningxia	23.37	19.9%	57.62	49.1%	32	27.3%	4.4	3.7%
Qinghai	36.23	25.5%	87.56	61.5%	8.8	6.2%	9.74	6.8%

Resource: Adjusted according to the China Environmental Yearbook 2015

2) The publicity of environmental protection information

Two regulations implemented in May 2008 by the State Council, named the "People's Republic of China Government Information Disclosure Regulations" and the "Environmental Information Disclosure Measures (for Trial)", officially regulate the government information and environmental protection information publicity. Then, the projects' EIA application status and approval results are required to be open to the public and published on the official website. In the same

year, the "Some advices on the issues relative to the People's Republic of China Government Information Disclosure Regulations" and "notice on the relevant issues concerning the charging fees of providing public information for the government" were put forward by the State Council and further regulated the checking fees, copy fees and sending fees when asking for government information. However, it was not until 2012, in the MEP's "The announcement of the requirement of making a construction EIA report abridged edition" (MEP announcement 2012. No. 51) that there was mention of the publicity of the open constructed EIA report.

Tab.5-11. The publicity of environmental protection information

Province	Time	Name	Highlights
Jiangsu	2006	Notice of Jiangsu Province Management Methods of Environmental Protection Publicity	Two years earlier than the first national regulations; Covers a broader range of environmental information; Includes environmental administrative punishment cases, environmental protection law enforcement and environmental protection department staff behavior norms and combats corruption regulations.
	2007	Advices on strengthening the open information on the provincial environmental protection system	Clear instruction of project EIA information needed to be published; Except for the actively published information, all the administrative and environment information that was not listed as closed or secret government

			information should be open to the public if required and applied for by the public.
	2008	Jiangsu Province EPB Environmental Protection Publicity Work Assessment System (trial)	The EIA institutes annual evaluation results are required to be open to the public.
	2011	Provincial environmental protection office of the government information disclosure of work fault accountability measures (trial)	
		Provincial EPB to clarify the work of false or incomplete information (trial)	
		Provincial EPB government information release coordination system (trial)	
		Provincial EPB government information disclosure work social evaluation system (for trial)	Assessment of publicity forms, process and time limitation, systems and effectiveness
	2013	Opinions on strengthening the information publicity of the supervision and control of pollution	

		sources working	
Guangdong	2012	Guangdong EPB further strengthens the EIA public participation and information publicity degree	Only a province among the case provinces made an illustration of the open briefing version of the EIA report on its local regulations.
		The notice of Guangdong EPB EIA institutes credit information management methods (trial)	
	2013	Guangdong environmental protection key field information open in special column construction regulations	
		Guide the information publicity of the supervision and control of pollution sources working	
	2014	Guangdong EPB information publicity guide	
		Guangdong environmental protection key field information open in special column construction regulation	

		Notice on strengthening the information release and management of the environmental protection public network in Guangdong Province	
		Notice on printing and distributing the information security responsibility and responsibility system of the EPB of Guangdong province	
		Compilation of a website management and information security system of Guangdong provincial EPB	
	2013 2014 2015 2016	Guangdong EPB government information publicity working key points	
Ningxia	2013 2014 2015 2016	Ningxia Environmental Protection Bureau government information disclosure guide	Guide the range, forms, time limits and accepting institution. Coverage is small and definition is ambiguous
	2014	Ningxia Environmental protection bureau task division of environmental information disclosure	Clarify the task division of the information that the different EPB departments are responsible for opening.
Qinghai	2009	Qinghai province	

		Environmental Protection Bureau Management Methods of Environmental Protection Publicity	
		Qinghai province Environmental Protection Bureau website information publishing methods	
		Qinghai provincial Environmental Protection Bureau government information open to the application of public instructions	Acceptance institutes
	2014	Qinghai province Environmental Protection Bureau News release system	
	2011 2012 2013 2014 2015	Qinghai province Environmental Protection Bureau government information disclosure guides	The coverage is the same as Jiangsu and Guangdong. The EIA information is only restricted to project the EIA and EIA document acceptance, the results of the examination and the approval

Resource: Author drawn according to the local government official website and documents review

The first official local government regulation on open environment information in Jiangsu, named the "Notice of Jiangsu Province Management Methods of Environmental Protection Publicity", was published in the year of 2006,

which is two years earlier than the first national environmental information disclosure measures (for Trial) published in 2008. The range of the environmental information that needed to be open to the public included the environmental protection agency and its responsibility, the state of the environment condition, regulations, standards and other documents of the environmental protection department, environmental protection planning, environmental protection administrative licensing approval and the progress and completion of the major environmental protection projects relative to the national, or local, economic development plan. It also included the investigation and reconsideration of the environmental administrative punishment cases, environmental protection law enforcement inspection and environmental protection department staff behavior norms and combat of corruption regulations. In 2007, it published the "advices on strengthening the open information of the provincial environmental protection system" and put forward that the government should publish the implementation of the EIA system and the EIA project approval and acceptance and the results of the examination and approval, as well as the results of the environmental protection examination after the project completion. The open project information should include a project overview (name, construction unit, location, size, etc.), the environmental impact and control measures, evaluation units, approval documents, public feedback, etc. One highlighted point in the regulation is that it argues that, except for the actively published information, all of the administrative and environment information that is not listed as closed or secret government

information should be open to the public if required and applied for by the public.

Since 2008, many regulations relative to government working assessment and responsibility have been created, such as the “Jiangsu Province EPB Environmental Protection Publicity Work Assessment System (trial)”, which mentions actively publishing institutes’ information, laws and regulations, plans and strategy, working, administrative approval, pollution charges, funding arrangements, environmental quality, environmental statistics and surveys, environmental law enforcement, environmental emergencies, supervision and complaints, behavior norms, construction projects and other work. The EIA institutes’ annual evaluation results are also required to be open to the public. Compared with other provinces, Jiangsu has much more advanced supporting and management regulations of environment information publicity. In 2011 it published four supporting documents to further regulate the environmental information discourse working, named the “provincial environmental protection bureau government information disclosure work fault accountability measures (trial)”, the “provincial environmental protection department to clarify the work of false or incomplete information (trial)”, which puts forward that the spreading of false or incomplete information should be dealt with according to the law or investigated for criminal responsibility, the “Provincial Environmental protection department government information release coordination system (trial)” and the “Provincial environmental protection department government information disclosure work social evaluation system (for trial)”. The environmental protection department government information disclosure work

social evaluation system invites the public and exporters to evaluate the publicity forms, process and time limitation, systems and the effectiveness of the environmental information, to determine whether or not the form of opening is convenient, with the information easy to be obtained, and whether or not it gains the approval of the basic level and the public, in order to ensure the public's right to know, participate and supervise. In 2013, the Jiangsu EPB also enacted the "opinions on strengthening the information publicity of the supervision and control of pollution sources working" to guide the information opening of the pollution sources.

Similar to Jiangsu, Guangdong province also carried out early practices of enacting local policies related to environmental information disclosure. As early as 2002, the Guangdong government regulated the government information relative to the social and economic development strategy, development plans, objectives and the completion situation and major decision-making process and policy issues, etc. [7]. The "Ordinance of Government affairs publicity of Guangdong Province" was passed in July 2005, with the legislation being three years earlier than the state's. As the supporting regulations, the "Measures for the assessment of government information disclosure work in Guangdong province (for Trial Implementation)", "Measures of Guangdong Province on the social evaluation of government information disclosure (for Trial Implementation)", "Guangdong provincial

[7]Guangdong provincial government advices on the full implementation of open government affairssystem on upper town level

government information disclosure work fault accountability measures (for Trial Implementation)" and "Coordination system of government information release in Guangdong province (Trial Implementation)" were published in 2009, which further regulate the legal duty of open public affirms. Based on the relatively mutual local government information publicity policies, a series of local environmental information disclosure policies were created.

For instance, the "Guangdong environmental protection bureau further strengthening the EIA public participation and information publicity degree" was enacted in 2012, according to which the local EBP is required to supervise the construction unity and the EIA institution is required to carry out an EIA report briefing version and be responsible for the truth of the EIA report. Even though in 2012 the MEP was required to open an EIA report abridged edition, Guangdong was the only province among the case provinces to make an illustration of an open briefing version of the EIA report on its local regulations. Some supervision and managing policies were created in 2013 and 2014, such as the "Guide for the information publicity of the supervision and control of pollution sources working", "Notice on strengthening information release and management of the environmental protection public network in Guangdong Province" and "Notice on printing and distributing the information security responsibility and responsibility system of the environmental protection department of Guangdong Province", to clarify the responsibility of the government departments.

Ningxia has a very small number of environmental information disclosure

regulations. The “Ningxia Environmental Protection Bureau government information disclosure guides” are the main working regulations of opening the environmental information. They have been published annually to guide the range, forms, time limits and accepting institution since 2013. However, the ranges in the government information disclosure guides are very general and small with less detailed illustrations. Taking the government information disclosure guide in 2016 as an example, the range of the actively open environmental information includes the “functions, leadership, responsibility and institutions of the Environmental Protection Bureau, policies and regulations, planning, administrative licensing, management and services, work procedures and dynamic information”. There is no definition of the management and services affairs, working process and dynamic information, which causes ambiguity in the practices. Some information, such as the charging of pollution fees, environmental quality monitoring and main environmental protection projects, is missing in the guide. It was not until 2014 that Ningxia published the “Ningxia Environmental protection bureau task division of environmental information disclosure" to clarify the task division of the information that the different EPB departments are responsible for opening.

The “Qinghai province Environmental Protection Bureau government information disclosure guides” have been getting published since 2011. In the year of 2015, the coverage of information opening had increased to 21 items, including the environmental laws, regulations and policies, protection planning, environmental quality, statistics and survey information and environmental

protection law enforcement, information on the EIA document acceptance, the results of the examination and approval, etc. The coverage is the same as it is in Jiangsu and Guangdong. From 2009, Qinghai has consequently published the "province Environmental Protection Bureau Management Methods of Environmental Protection Publicity", "Qinghai provincial Environmental Protection Bureau government information open application public instructions" and "Qinghai province Environmental Protection Bureau website information publishing methods". The "Qinghai province Environmental Protection Bureau website information publishing methods", in 2009, requires that the environmental project assessment center should publish a technical evaluation of the construction project EIA report, the training and management of the EIA experts and engineers, the EIA technology consulting services and a working report and agency profiles. In 2014, the province also published the "Qinghai province Environmental Protection Bureau News release system" to manage the environmental information news release. Compared with the supporting and managing policies to deal with working faults and false, or incomplete, environmental information, Qinghai pays more attention to the organizing procedure and forms of information publicity, such as determining what information should be released and clarifying it at a news release conference. In 2014, the government asked for advice on implementing the "Qinghai provincial environmental protection bureau government information disclosure work fault accountability regulation", but two years later it is still completing the process, with voting to pass it now.

Despite the central government enacting a policy for government information opening, some of the main content is still missing in the local regulations of the western regions, for example there is no mention of opening the full text of the EIA reports in either Ningxia or Qinghai. The content relating to the opening of information, such as the pollution charge fees and environmental quality, is still missing from the Ningxia local regulations. At the same time, the penalty for government misbehavior, such as providing false data, has also been carried out in the case provinces. This also reflects that the western regions are reluctant to open their environmental information.

5.3 The “dual” policies and regulations on SEA

Since the MEP published the "Technical Guidelines for PEIA” in 2009, most of the provincial, city and town governments enacted the relevant supporting regulations in different forms to support the development of the PEIA. For example, the Shanghai, Chongqing, Shaanxi and Inner Mongolia provincial regulations explicitly state the requirement of a PEIA list and alternatives to environmental protection design and environmental impact monitoring. However, similar to the policy and mechanism innovation of the other policies mentioned above, the SEA policy was first enacted by the eastern region, due to the increasing environmental awareness and high environmental issues of these areas, guided a certain amount by the early PEIA practices and then officially formed by the central government and then passively transferred and enacted in the western region. Since 1999, Jiangsu province has been issuing a series of policies and measures, actively

promoting and carrying out the planning of the EIA. Especially after 2007, when the province was listed in the first batch of pilot provinces in the state, some key PEIA work, such as the Jiangsu coastal area development planning, the development plan along the river and the 11th Five-Year highway network planning, was carried out. “The working scheme of starting the PEIA pilot program in Jiangsu” was carried out, further regulating the PEIA process and the methods of PEIA. In 2006 the Jiangsu province issued the “Notice of the people's Government of Jiangsu Province on carrying out the work of PEIA in accordance with the law”, which clearly defined the plans reviewed by the provincial government, and other relevant administrative departments had to submit an environmental impact report before gaining approval. The punishment rules and the relevant responsibilities of PEIA are also detailed. The “Opinions on strengthening the work of PEIA” in Jiangsu aims to encourage vigorously promoting PEIA to handle the relationship between the economic and social development and environmental protection at the macroscopic level benefit the scientific industrial layout and the allocation of resources and prevent ecological damage to ensure environmental safety policies and practices. In the year of 2007, Jiangsu and Ningxia provinces were listed as the first round of planning SEA pilot provinces, because of “their conflicts between economic development and environmental protection”. In 2008, the Jiangsu government published the “Jiangsu province PEIA pilot working plan” and determined the general requirements, basic principles, main contents and tasks of the pilot work and the implementation of the plan. However, it was not until 2011

that Ningxia published the first local regulations, named the "Notice on Earnestly Strengthening the Work of Planning Environmental Impact Assessment".

Guangdong published "The notice of how to do a better job in province PEIA" in 2010 after the same practices in the Shenzheng municipality promulgated "the notice of implementing the law of EIA and how to do a good job of PEIA" in 2005 and further formed an integrated mechanism of various government department participating in PEIA working to promote the early invention of PEIA.

As well as early and actively starting the PEIA policy making, the SEA polices also covered a broader range and supported policies, such as the conference, or consultation, policies in Guangdong. As mentioned previously, instead of integrating a large amount of the general public and stakeholders to integrate into the decision-making process, China's PEIA was mainly based on the "total amount of pollution emission control" by implementing the restriction of the "ecological red line, environmental quality baseline and resources, using the top thread and negative list of environmental assessments"[8]. The advices of the Guangdong EPB relating to the "advices on starting a PEIA conference or consultation" further encouraged the stakeholders to consult in making the PEIAs and integrated into the SEA is the improvement from the more Chinese style and traditional PEIA to a

[8] On 26th October, 2016 the MEP published the "Notices on strengthening the environmental impact assessment as environmental quality as code" and carried out the implementation of the EIA to improve the environmental quality management

PEIA process that is widely accepted in the western country. The regulations, such as “strengthen the linkage work of PEIA and construction EIA work” in Guangdong and“Jiangsu social environmental monitoring institutes monitoring ability qualified management methods (trial)” in Jiangsu in the year 2015, that are more detailed regulations than the state level regulations, leading to a more successful implementation PEIA, will be discussed later.

The local regulations of SEA were enacted much later in Ningxia than they were in Guangdong and Jiangsu. It was not until “the notice of the general office of the autonomous regional people's government on further strengthening the work of environmental impact assessment in the whole region” was published in 2014 that Ningxia province had its first local legislation of SEA. Qinghai, however, has not been promulgated yet. The Qinghai government only published an official document stating that MEP requires governments at all levels to study and implement the regulations and strengthen the work of PEIA.

Tab.5-12. The local regulations on PEIA

Ningxia	2014. 4	The notice of the general office of the autonomous regional people's government on further strengthening the work of EIA in the whole region
	2016. 6	The notice of the general office of the autonomous regional people's government on further strengthening the work of PEIA
Qinghai	-	-
Guangdong	2010. 6	The notice to do a better job in province PEIA in our province
	2012.11	Guangdong EPB further strengthens EIA public participation and information publicity degree
		Notice of Guangdong provincial EPB on printing and distributing the measures for the managing of EIA institutes credit information disclosure (trial)

	2012.12	Notice of Guangdong provincial EPB on further standardizing the work of the Guangdong provincial EIA institutions recording
	2015.12	Advices of Guangdong EPB to "strengthen the linkage work of PEIA and construction EIA work"
		Letter of Guangdong EPB on the advices of "industrial park PEIA 'list management' and linkage work with EIA pilot work plan
		Advices of Guangdong EPB on "advices on starting PEIA conference or consultation"
Jiangsu	2006. 1	Notice of the people's Government of Jiangsu Province on carrying out the work of PEIA in accordance with the law
	2008. 5	The working scheme of starting PEIA pilot program in Jiangsu
	2008. 8	The notice on doing a good and better job in the EIA of coastal development plan
	2010. 5	Opinions on strengthening the work of PEIA
	2011. 5	Provincial Government Office transmission of the EPB and provincial DRC notices on further strengthening the PEIA
	2012.10	"Advices on actually strengthening the EIA environmental protection public participation
	2015.9	Guiding advices on Jiangsu province construction project EIA reform pilot working
	2015.9	"Jiangsu social environmental monitoring institutes monitoring ability qualified management methods (trial)"
	2016.10	Methods of Jiangsu province construction project EIA reform pilot working
	2016.11	"Jiangsu province EIA institutes credit assessment and management Interim measures (for Trial)"

Resource: Author summarized from the EPB official website of different provinces.

As well as the direct regulations of PEIA and the PEIA regulations at the province level, the regulations on EIA system management and the local regulations enacted by municipal governments are also important parts of the Guangdong and Jiangsu laws and regulations system. Some examples are: March 2005, Shenzhen (belongs to Guangdong) municipal government promulgated "the

notice of implementing the law of EIA and to do a good job of PEIA", which added illustration to the billing standards of PEIA and required the government and relevant departments to avoid falsification and dereliction and to accept the supervision of the legislature and public opinions. In addition, the Shenzhen municipal government enacted the "Regulations of the Shenzhen Special Economic Zone on environmental protection", in which it was mentioned that, for the "laws, regulations and normative documents on industries, energy, transportation and tourism development, water resources development, land use and sea area use that may have a significant impact after the implementation, the drafting department should organize the environmental impact assessment form and submit the EIS" (Article 11). It was required that the main contents of the policy EIA would include four parts: the background and purpose of the policy, the environmental impact caused, measures to reduce or avoid environmental impacts and conclusions. Similarly, in July 2006, the Nanjing (belongs to Jiangsu province) municipal government issued "the notice of Nanjing on carrying out the work of PEIA in accordance with the law". In November 2012, the Guangdong provincial EPB issued "the notices of Guangdong EPB management measures on EIA agencies" and "the notices of Guangdong EPB measures on credit information disclosure of EIA institutions (for Trial Implementation)".

The clearer and more detailed guide of SEA in Jiangsu and Guangdong lead to wider and more creative SEA practices. Even though it missed out on the opportunity to become a pilot area for some of the meaningful EIA policies and to

make SEA political innovation, the western region could, generally follow the national SEA laws and regulations. However, the PEIA policy implementation issues also lead to unsuccessful SEA practices, disappointing SEA outcomes and a superficial SEA process. The validity of PEIA was doubtful, which can be seen from the following cases.

5.4 The "dual" SEA practices: case description and report review

The different policies and regulations lead to different PEIA practices. The author transcribed the case descriptions provided in the interviews by PEIA staff members in their daily work to show both successful and unsuccessful PEIA practices. In addition, as the full contents of the PEIA report are, currently, not required to be open to the public, the author reviewed 20 PEIA reports (six in Guangdong, six in Jiangsu, four in Ningixa and four in Qinghai) obtained from the interviewees to reflect the gaps in the quality of the PEIAs in different regions to provide a more complete picture. To avoid bias, the reports were also reviewed by an interviewee who works as the vice-president of one of the EIA institutes. In order to protect the interviewees, no names or detailed descriptions are provided in this current thesis.

5.4.1 Case description

1) Case one:an industrial park in one western city (unsuccessful government negotiation because of the high attention placed on economic

development)

Description: A food industry (relative to raising livestock) decided to invest more than ten million Yuan in a target province and to construct in an industrial park. The industrial park had a development plan that had not carried out PEIA at that time. The enterprise wanted to be located at the intersection of the road for transportation convenience and would not otherwise move to there.

Conflicts: This food industry includes large amounts of open space. At this transport intersection, two chemical industries with rising dust and other kinds of pollution emission were already located there and were very close to the selected area. Thus, the location for a food industry is unreasonable. However, this food enterprise did not accept any other land choices.

Barrier of PEIA: This enterprise will bring a large amount of tax income to the local finance and will create job opportunities for the local citizens. An industry with an investment higher than ten million Yuan is rare in this undeveloped province. Thus, the owner of the enterprise put pressure on the local government. During the process of carrying out the PEIA, although the EIA institution disagreed with the plan, the local government leaders paid much more attention to the short-term economic benefits and asked the leader of the EIA to provide favorable results for the PEIA, using their social connection. The SEA institution had to minimize the environmental impact of the two industries on the food industry during the writing of the EIS and reached the conclusion that the two industries had no direct impact on the land selection of the food industry.

2) Case two: an industrial park PEIA in the eastern region (successful government negotiation)

Description: the industry park located at the urban fringe was approved by the construction department of the local government several years previously. Along with urbanization and the introducing of industries, the industrial park has exceeded its range to the urban areas.

Conflicts: Managers had different views before starting the PEIA. Some people argued that this industrial park is an old industrial reform project and that it received provincial agreement to implement the plan. However, being a local EPB without PEIA, the future development of the industrial park would be restricted by environmental issues.

Solution: The person in charge of the EPB PEIA advised the local government several times. The advices of the EPB received attention from the local government. Government leaders and directors of other government agencies held a meeting to listen to the advices of the EIA institutions and EPB. The government leaders agreed that, 'even if they gave up this industrial park plan, the city would not follow the old way of "pollution first and manage later". The local government provided the finances, the committee of the industrial park provided basic data and information and the environmental monitor center provided free support to the EIA institution and completed the PEIA during the planning making process. The integrated parties agreed that, "in the future, construction of the industrial park would be strictly implemented according to the advices of the PEIA and the plan"

3) Case three:one industrial park in one western city (late invention time)

Description: The plan is an industrial park based on existing industrial enterprises. There is one local foodstuff processing industry that has a high reputation.

Conflicts: Since several years ago, the environmental protection has not been receiving great attention; the unreasonable location of the enterprise did not receive careful consideration. The enterprise is located in the upper reaches of a drinking water source protection area. The adjacent surface water of the enterprise is in ecological sensitive areas delineated by the city's ecological environment protection planning. The location is very sensitive. An environmental accident once occurred that polluted the drinking water sources, caused by one of the enterprises located in the upper reaches of this company.

Barrier of PEIA: The industrial plan classified the land as a Type II industrial area (Food Industrial Park District), which is not reasonable for a large displacement, with a high concentration of pollution of a food producing industry. However, the PEIA did not engage in a decision-making process and the original plan could not be changed. Thus, only some mitigation methods were put forward, such as adjusting the type of food industry and focusing more on food storage.

4) Case four: Late invention of PEIA and an in time remedy in one eastern region (late invention and successful negotiation)

Description: one town has made an industrial park plan without carrying out PEIA. After creating the plan, the land was acquired through an auction and all of

the formalities were about to be completed.

Conflicts: When carrying out the PEIA, the PEIA institutes found that the plan included the construction of a real estate project only 50m away from a heavily polluted industry that was listed as the main control and management project by the provincial EPB. However, the real estate land had been acquired, the planning had been completed and the construction work had started.

Solution: The approval of a PEIA brings great pressure to the EPB and this became a dilemma. The local government also had communication and several discussions with the environmental protection department, holding several meetings. In considering the huge influence of the pollution, the local government finally provided some financial support and tax preference and the enterprise also provide finances to improve the facilities and move out of the region.

5) Case five: one industry park reforming the PEIA in Jiangsu (successful public participation)

Description: This was a provincial level industrial park before making the industrial park reform master plan. The restriction elements are the issues rooted in history, such as the higher percentage of heavy industries, mixed industrial and residential areas and incomplete sewage pipe network facilities.

Conflicts: The original industrial park reform plan made by the planning department was designed to move out a large number of industrial enterprises and to change the industrial areas into commercial and official space. However, this was rejected by the local governments and enterprises, because of the high

financial investment, the complex issues of unemployed staff and the relocation of enterprises.

Solution: During the PEIA process, the EIA institution actively organized public participation. By interviewing local residents during the fieldwork, they found that the local residents had a strong sense of environmental protection and strongly supported the closing down of polluting industries and they agreed to move out of the previous residential areas. Finally, two large enterprises were removed.

5.4.2 PEIA report review

Tables 5-13 and 5-14 show the evaluation of the PEIA report, the overall quality of the PEIA report and the invention time, alternatives, evaluation index, process, forms of public participation, government negotiation and such questions as: does the PEIA consider the time and special plan range, contain both qualitative and quantitative analysis and consider the environmental impact, ecological impact, social impact and cumulative impacts? After summarizing the twenty PEIA reports in Qinghai, Ningxia, Jiangsu and Guangzhou, the author found that, in general, the quality of each of the PEIA reports differed. Unsatisfactory PEIA reports existed in both the western and eastern region. However, compared with the western region, the eastern region had the advantage of some good and qualified PEIA reports, especially in the Jiangsu provinces.

Tab. 5-13. The evaluation of PEIA report

R		In	Quality of evaluation	Process	Coo	Public	O

egion		vention	Cumulative impact	Alternatives	Ecological /social impact	Comprehensive methods	Proper process	peration	participation	verall
Guangdong	Jieyang EDZ plan	E	Y	N	Y	Y	Y	N	Y	V
	Shaoguan industrial park	L	Y	N	Y	Y	Y	N	NA	G
	Fengxian EDZ western IP	E	Y	Y	Y	Y	Y	Y	O	VG
	Fo shan Gaoming Cangjiang IP	L	N	N	Y	Y	Y	N	Y	G
	Fo shan Sanshui IP	L	Y	N	Y	Y	Y	Y	Y	G
	Huizhou Zhongkai high-tech IP spatial dev. plan	E	Y	N	Y	Y	Y	N	Y	B
Jiangsu	Changshu International IP	E	Y	Y	Y	Y	Y	N	Y	VG
	Taizhou Hailing IP	E	Y	N	Y	Y	Y	Y	Y	VG
	Kunshan high-tech IP	E	Y	N	Y	Y	Y	Y	O	VG
	Tongzhou EDZ	L	N	N	Y	Y	Y	N	N	B
	High-tech fluorine chemistry IP	L	Y	Y	Y	Y	Y	N	Y	B
	Suzhou IP Weighting old town reconstruction control detailed plan	L	Y	Y	Y	Y	Y	Y	Y	G
	Changzhou Xinzha IP	L	Y	Y	Y	Y	N	N	Y	G
N	Ningxia Coal	L	Y	N	Y	Y	Y	N	Y	B

ing	group Yuanyang Lake plan									
xia	Wuzhong City Jinji Wool Textile IP overall plan	L	Y	N	Y	B	Y	N	Y	G
	Yinchuan Desheng IP overall plan	L	N	N	B	Y	Y	N	Y	B
	Shuizuishan high-tech EDZ exceeds range. Change of location	L	Y	N	B	Y	Y	N	Y	G
Qing	Haidong IP medium and small size corporate park plan	L	Y	N	Y	Y	Y	N	Y	G
hai	Xining EDZ Nanchuan PI master plan	L	Y	N	Y	Y	Y	N	Y	G
	Xining Datong town Beichuan PI master plan	L	Y	N	Y	Y	Y	N	Y	G
	Qinghai Dule IP plan	L	N	N	Y	B	Y	N	Y	B

IP: Industrial Park; EDZ: Economic Development Zone; E: early invention time: L: late invention time; Y: yes; N: no; O: others forms of public participation, except interview, and published on the official website; G: good; V: very good; B: bad.
Resource: Author drawn according to the PEIA report review

In the aspect of invention time, out of the six provincial and city level industrial park PEIAs in Jiangsu and Guangdong, two of them in Guangdong and three of them in Jiangsu had early invention before the approval of the industrial plans and the remaining one in Guangdong had the PEIA just after the plan was

approved, but before the large-scale construction. Out of the eight PEIA reports in Ningxia and Qinghai, none of them were implemented before the approval of the development plan. In addition, none of the eight cases studied included alternatives or "zone" plans in the western province, but, in Jiangsu and Guangzhou, both "zone" plans and alternatives were considered in some plans, such as the Fengxian economic development zones western industrial park plan, which involved zone action plans, and the Ghuangshu international industrial plan, which considered two types of industrial layouts provided by the plan making agencies. In terms of environmental impacts evaluation and using quantitative analysis, compared with the western region, more PEIAs in Jiangsu and Guangdong involved an analysis of the cumulative impacts and the impacts on society and ecology in the western region, The PEIA reports in Qinghai also considered more ecological and cumulative impacts than the reports in Ningxia, partly because of the environmental protection in Qinghai having more significantly strategic roles and receiving high attention. Turning to the forms of public participation, most of the PEIAs among the twenty reports used the official website and questionnaires and involved the public to be engaged, as required by the EIA law and the regulations of public information publicity. Two industrial parks named Kunshan high-tech industrial park and Fengxian economic development zones western industrial park have held consultations and a public hearing during the process of the PEIA. Furthermore, none of the PEIA reports in the western region emphasized that they had been involved in discussions with other government agencies, although five of

the 12 PEIAs in the eastern region PEIAs advised that, in the PEIA process, the EPB and other government agencies, such as land and resources departments, were involved.

The PEIAs in China, in both the western and eastern region, are based on technological methods and a systematical process. In general, the different EIA situations adopt some of the most commonly used methods, such as expert consultation, with some methods being used less, such as environmental economics analysis and input output analysis. However, due to the differences in the technique skills and qualifications of the staff, a broader range of PEIA methods are used in the eastern region than in the western region in the process of environmental factors evaluation, such as system dynamics and overlay maps and grey system analysis. Such methods as system dynamics analysis and environmental economics analysis are almost never used in the PEIA process in the western region, because of their complex calculation methods.

> *"Before the publishing of technique guidance, we had never used grey system analysis before and I don't know how many people in our institutions know how to use grey system analysis and overlay maps, but I think it is almost none". (E-Q-1)*

Technical level methods with a low technological requirement and relative maturity in the traditional EIA are used in the western region, such as expert consultation, scenario analysis and a look-up table. Quantitative methods, such as

index methods and load analysis, are also used more often than the qualified methods, such as pressure-state-response analysis.

> *"Even if the technological guidance was published, it does not provide the details. I mean they tell you what an overlay map is, in which process it can be used, for example, and then what kinds of results it gives, but no one tells us where to down the GIS and how to use the GIS" (E-N-3 and E-N-4)*

5.5 The SEA implementation

5.5.1 Different degrees of value of environmental protection

In the long period, paying more attention to economic development and less attention to environmental protection exists in all regions in China. Many government leaders do not like carrying out PEIA. They start the industrial park construction firstly and apply for PEIA afterwards and do not communicate with the EPB or co-ordinate with the environmental protection department (Wu, 2011). However, this situation exists more commonly in the western region with less national strategies and supporting of policies. Examples of national strategies reflect that both the central government and the local government have "dual" attitudes and ways in the development of the western and eastern regions. As mentioned in the thirteenth five-year plan, Ningxia still focuses more on economic

development. Neither sustainable development nor ecological civilization is mentioned as the main target of the local economic and social five-year development strategy. Creating green, insisting on green development, pursuing green and sustainable development have been made the principle aims in the Jiangsu and Guangdong development strategy plan. At the same time, the West Development Strategy was also enacted by emphasizing putting economic development as the first priority. Even though the national government continually published regulations to encourage the implementation of SEA, such as strengthening the cooperation with the PEIA and project EIA, it is "only when the government leaders pay high attention to ecological protection, make ecological civilization as the development strategy and make the relative supporting performance evaluation under the system concerned with environmental quality that the implementation of SEA would be ensured" (G-J-2).

Without policy supporting and strength and with a lack of operable supporting polices, such as deleting or shrinking the influence of the GDP target when judging officials working performance and adding the evaluation of environmental quality, the PEIA implementation also faces many issues.

> *"The value of the environmental protection the local government has and the attitudes the local government leaders have are the most significant influences on the process and outcomes of PEIA implementation."(E-N-3)*

"The outcomes are deeply determined by the attitudes of the local government." (E-Q-1)

When conflicts exist between protecting the environment with SEA and the GDP growth of local areas, the local government sometimes gives priority to developing the local economy. One key example is what happened in May 2009 in Yangzhou city in Jiangsu province. The Yangzhou Industrial Park was located at the upper areas of the upwind area. Two of the companies under the Yangnong Group Company, named "Youshi Chemistry" and "Ruixiang Chemical Industry", constructed high pollution chemical projects. The building of this project lead to a high COD (Chemical Oxygen Demand) and an increasing number of the population suffered from a respiratory system disease and malignant tumors, which received wide attention from the public and the NGO. However, the huge economic income lead the Yangzhou government to introduce the industries into the industrial parks and the arguments of the PEIA were slipshod in the work. "Only in 2008, the tax revenue of these two companies was 200 million RMB and accounted for half of the tax income of the industrial park" (Luo, 2012).

However, the issues are much more serious in the western region than in the eastern region. The gaps existing between the western region and the eastern region can be reflected in two aspects. Firstly, based on the dual economic and social development foundation, compared with Jiangsu and Guangdong, where economic

agglomeration effects have been formed in order to achieve GDP growth, the local government in the western region have to make more efforts to attract outside investors by making preferential policies and offering other kinds of favors, such as priority in land selection and simplifying the approval process. Restricted to the economic development potential, using the same target to evaluate the performance of the government is unfair. Depending on the high potential of the economic development ability, the governments in Qinghai and Ningxia have to try their best to stimulate investment and, thus, ignore the environmental issues.

> *"The local government leaders said to me how hard they and other government leaders worked in order to allow the projects to construct in our provinces. They travel many times and have several meetings with entrepreneurs who are difficult and, finally, they successfully persuade them to invest in our province. How would you reject it, because of their location and your PEIA?" (E-Q-2)*

The situation is the same in Ningxia and, as said by one EIA engineer working at the top level of one EIA institute:

> *"It happens sometimes before starting the PEIA; the government leader would tell us this project was introduced by government leaders who went through innumerable trials and tribulations from the eastern region. No matter how, they beg me to make it pass, to save them and to make a contribution to the economic development of our province" (E-N-1)*

On the other hand, the government officials' employment environment is an "internal labor market", which means officials seek jobs in a relatively closed

institutional environment. When they get fired, it is hard for them to find a job outside the organization (Luo, 2012). Government officials cannot choose to give up their positions randomly. The different positions in the system have huge differences in terms of responsibility, power and benefits. Thus, once they enter government departments, officials have to make efforts to hold on to their position and pursue promotion opportunities. Also, a tenure system is used in government departments. Local government officials have to be re-appointed every five years, which means that government officials have to focus more on improving themselves in a short time and portray a more obvious performance, in order to receive the acceptation of the upper level government and achieve promotion. However, improvement to the environmental quality cannot be seen in such a short time. Instead of paying attention to environmental issues, officials are inclined to give their attention to the GDP growth of the local regions, which is the most significant index in the personnel performance examination system. Government officials at all levels compete for a high GDP growth, in order to gain a high performance evaluation. One example is that in China's "fifteenth five-year plan, the annual economic increase rate was expected to be 7.5%, while, in the published economic development plans of 31 provinces in China, the expected average economic increase rate was 10.1%, with the maximum being 13% and the

minimum being 8.5%, and this lead to the NDRC urgently dispatching a document requiring the province to decrease the economic development speed (Jiang 2009).

The provincial government set the economic development target that was to be achieved annually. Then, the targets were distributed to the city and town level governments and then the country level government. “The government officials were only considered to have a good performance if they achieved the economic development target, which is a certain amount of money for investment” (E-N-1and E-Q-3). Not achieving this certain amount of investment lead to a negative influence on the government officials. Less mature investment circumstances created much more difficulty in attacking the investment of the western region, which lead them to pay less attention to environmental protection and have a reluctant attitude relating to implementing PEIA.

Secondly, compared with their eastern counterparts, the leaders in the western region had less environmental awareness. The ideas of the western government leaders relating to environmental protection were weak compared to their eastern counterparts’ ideas. “The effect of policy implementation depends on the cognition, understanding and identification of the implementer of the public policy and its value. The strong identification of the policy, high responsibility for the work and the spirit of innovation of the policy implementer are important conditions for an

effective implementation of the policy" (Chen, 2003). When implementing an environmental policy, the awareness of the government leaders is very important. "Changing the government leaders also means changing the attitudes of environmental protection" (G-G-2). "Obvious evidence in China is President Xi Jingping, who paid higher attention to environmental protection than the previous president. In 2005, he visited a village that had closed its coal mining industry and said 'Previously, we said we wanted both green water and green mountains and gold mountains and silver mountains. Actually, green water and a green mountain are gold mountains and silver mountains'. Then, a series of regulations and laws relative to environmental protection was promulgated. In January of that year, he viewed the Chongqing and said that the Yangzi River areas should not receive economic development with the cost of the environment. The provinces along the Yangzi River competitively enacted water basin environmental protection regulations" (U-J-1)

Government leaders in the western region can more easily set environmental protection. It is a common view of the interviewees in the western region that their government "pays much attention to economic development and to changing the economic and social backward condition and it emphasizes the attraction of investment and seeks for GDP to leap and bound the development of economy" (G-

Q-1, G-Q-2; G-N-3; E-N-1; E-N-2), instead of "considering the consequences of exploration and industries introduction (E-N-1)." "Giving the highest priority to economic development unquestionably decreases the power of the SEA and PEIA, due to the local government not wanting the environmental protection departments to determine the industries structure, types and locations that they had made up their minds about and had decided with entrepreneurs and other government leaders" (E-N-3). "Even though some projects could bring large negative impacts to the environment and human health and their locations are not reasonable, if they could bring GDP and an investment increase to the local areas, they are welcome" (G-Q-2). In contrast, Jiangsu and Guangdong made a target to increase the ecological civilization construction, along with economic development, and to object to blind economic development. In 2007, the Jiangsu government enacted the "Advices on strengthening the northern Jiangsu newly constructed Chemistry industry management" and increasing the requirements for market access of the chemistry industry. For example, two cities in Jiangsu, named Haian and Nantong, increased the requirement for the investment of solo chemical projects from 20 million to 100 million Yuan. In 2007, 50% of the chemistry projects were rejected after considering the environmental impacts. Suzhou city in Jiangsu rejected more than 550 projects, because they did not conform to the industrial policy, or had an

improper site selection, and they were relative to 21.5 billion Yuan of investment. “The investment in high energy consuming and highly polluted industries decreased gradually, because of the serious EIA and environmental consideration. The annual decrease rate was more than 30% in the cement manufacturing, iron and steel industries” (G-J-1).

In addition, even though some government officials had mentioned the importance of environmental construction and environmental quality improvement, in practice conflicts occurred in benefits distribution among the environmental protection and economic development or social development. Also, when holding the view about giving economic development the highest priority, government leaders made a concession to the economic and social factors, affecting almost all of the processes of PEIA, including the process of invention time and the PEIA process, SEA institutes management, the validity of government negotiation, financial and human resource supporting and the public participation process. This influence created more disadvantages for the undeveloped regions, because they largely depended on financial support and other kinds of support from the central government. One example is Qinghai, which placed high attention on the environmental protection of the central government. “The ecological environment in Qinghai has a national level long-term strategy meaning. The global climate

change and domestic environmental problems lead to environmental issues, such as the glacier melting and grassland degradation that received high attention from the state, scholars and experts. The central government provides a great deal of support to our provinces and the local finance benefits from all kinds of environmental protection funds. However, PEIA implementation is still facing many pressures. Nearly 50% of the residents are ethnic minorities in Qinghai, including 33 among the 55 ethnic minorities. Each of them has their own culture, religion and living habits and many ethnic groups have their own language and text. In these ethnic group regions, the economic and social development standards are very low. Some of them even live in a primitive stage and live like a clan. Even though the local government leaders place a high value on environmental protection, maintaining the stability of the ethnic minorities is the primary problem in our province, and the question remains relating to solving the water and electricity supply problems and improving other infrastructure, such as education and hygiene" (E-Q-4)

5.5.2 Different attitudes of local governments towards PEIA and the process of government negotiation

Consensus building compared to a sudden quarrel is conducive to an optimal solution, making it easier to implement the policies (Lieberthal and Oksenberg

1988). In China, the most efficient way to build consensus is through negotiation. As mentioned previously, negotiation exists in both the vertical power structure and horizontal power structure. It happens between the same agencies in different levels and different agencies in the same level and it is efficient to arrange the targets, budgets and various duties in a negotiating way. In China, as part of political art, fierce debate does not exist to protect the "face" of both of the discussion sides. In addition, in the work of the various government agencies, such as the urban planning bureau and urban forest bureau, when conflicting with government development projects, they had to negotiate with local governments to get their agreement. This kind of negotiation, to some extent, enhances the rights of the government and even makes the power of the policy leaders exceed the regulations (Barbara and Leonard, 1995). This government negotiation plays an extremely important role in determining the outcomes of PEIA. SEA policies involve a variety of integrated policies and they have to distribute the interests of different organizations and individuals and the implementation is much more difficult (Yuan, 2008). Government negotiation is the method China's government uses to achieve harmony and avoid conflicts between the different government agencies.

On one hand, although EPBs have been given veto rights to the projects, programs and plans, they prefer to use "a more conciliatory approach…and keep

with their need for good relationships with other government departments" (Sinkule and Ortolano, 1995).

> *"We have to talk to others when we have our own difficulties and ask for understanding from other departments. Generally, local government leaders say to me how important the projects are, while we tell them how many negative environmental impacts have occurred and then we discuss several times to find the balance." (G-N-1)*

Depending on the level and location of the economic development zones, the reviewing rights of the regional plan can be distributed to the state council (for example cross provinces economic zones and urban master plans), the government at all levels and the planning bureau at all levels. "In order to not make the government department at the same level to loss face, negotiation is a valid process to solve conflicts" (G-Q-1). Each department has its difficulties. Local governments have economic development targets, land & resources departments have the responsibility to manage the land use, land rentals and sales. The EPB has to implement the role of management of the environment and protection of the environmental pollution caused by the economic and social development. Compared with the eastern region, the government leaders in the western region are more bureaucratic and short-sighted, because of the lesser social development standards and redundancy administrative system. As said by E-N-1

> *"Compared with other departments, such as financial departments, and education departments, environmental protection departments are considered weak, because we are not responsible for money distribution or education resource distribution and directly connect with people's daily life. Also, we have water departments and forest departments that are also related to natural resources. Our advices are not as powerful as other departments' and in our provinces now the voices of environmental protection are easily affected by the voices of other departments and we compromise to the idea of developing the economy." (E-N-1)*

On the other hand, the PEIA process goes stumblingly when other developments, especially the government leaders, feel their responsibility is separated by EPBs and their power is under pressure from the suppression of EPBs, which leads to the phenomenon that "the plans were made by the local government and approved by the planning land and resource department, when the construction work was starting or was completed, and the environmental protection department" (E-Q-2). Plans get their approval from the planning department first and then supplement the PEIA documents. On the other hand, the EPBs are hesitant to implementing tough measures to avoid this phenomenon. They try to obey the supervisory management of the central government and avoid conflict with other bureaus. For example, in Ningxia provinces, the

> *"Local government leaders, planning departments and land and resource departments have the responsibility to manage the local economy, attract investment, make development plans or approve the land use rights. The government leader, though, puts in effort to encourage the investments from outsiders and to manage the economic development zone, so why should it be influenced or determined by SEA institutes." (E-N-2).*

Tab. 5-15. A horizontal structure of the policy making among agencies

Level	Government	Construction	Land& resources	Environment Protection
National	The State Council △	Ministry of Construction	Ministry of Land & Resources △	Ministry of Environment Protection △
Provincial	Provincial government △	Ministry of Construction	Provincial Bureau of Land & Resources △	Provincial Bureau of Environment Protection △
City and town	City government △	Bureau of Urban Planning △ Bureau of Garden	Bureau of Land & Resources △	Bureau of Environment Protection △

△Responsible for plan review Responsible for plan management Responsible for plan making

Resource: author drawn

The local government is the upper superior administrative management department of the EPB/EPO and is responsible for the management of personnel and the financial affairs of the EPB/EPO. The EPB/EPO, on behalf of the local government, is responsible for the management of the environmental protection work related to the areas. Although EPB/EPO has the duty of the implementation and supervision of the environmental protection policies and the punishment for misbehaviors and violations, its fundamental interests are consistent with the

government interests. Although the local EPB receives management from both the upper level EPB and the same level local government, the personal and financial support is completely managed by the local government. Thus, the dominant power of the upper level EPB to lower level EPB is very limited. As a government functional department, the interests of the EPB are the same as the government's and consist of two levels: public purpose and individual/organization purpose. Public purpose is, namely, social management and requires the government (government officials) to undertake the roles of maintaining social order, steady economic growth and providing public goods and public services. On the other hand, government officials have their individual purpose, such as seeking economic benefits for the organization or for career promotion for individuals. The EPB has to be managed by both the upper level EPB and the local government.

In addition, in considering the interests of individuals and the organization, the local EPB will pursue more benefits and initiatives for their own departments and local government. Once the economic interests of the local areas and the opinions of the superior EPB are divided, the cities or town EPBs will protect the interests of their own benefits and local benefits. In considering the good intentions of the same level government in stimulating investment, they are subject to the intervention of local government officials and pressures from the enterprises,

government and other aspects. The EPB is always in accordance with the intention of the government at the same level and reduces the level of the SEA evaluation, simplifying the evaluation process, or simply having some say in the implementation of some pollution projects and industries.

> *"The power of the voice depends on the government awareness of government protection and the obvious environment impact it will have" (U-G-2)."An industrial park exploration plan or reform plan relative to more residences and more environmental attention would lead to a more successful government negotiation of EPB." (G-G-1)*

Resulting from the government negotiation and the power of the voice of environmental protection, the outcomes of SEAs differ between the western and eastern regions. As said by an EIA engineer in the western region

> *"It is very common for us to receive the government leader's or local government's requirement and we say 'we want the cheapest price with fast speed', which means they don't know want exactly the environmental problem is; they only want a results of SEA". (E-N-1)*

As a result "there are no industrial park plans and the economic zone development plans have been rejected because of the PEIA until now" in Ningxia (E-N-2) and in Qinghai (G-Q-1), but, in Jiangsu and Guangdong, "several industrial parks plans were rejected because of the negative environmental impacts" (G-J-2 and G-G-3). "Just in early September 2016, one chemistry industrial park plan was rejected because it was planned to be

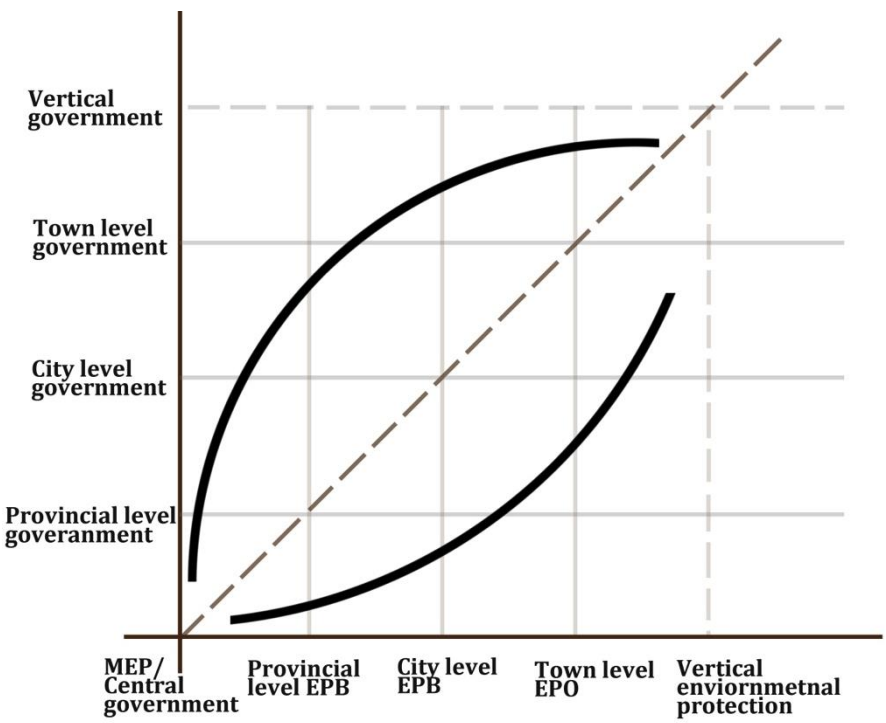
located close to a water head area in the PEIA process, even though it would bring the province a large amount of tax incomes" (U-J-1). In 2013, Jiangsu provinces reviewed 36,429 EISs of project EIAs, involving 3143 billion Yuan, and voted against 160 projects relative to 9 billion Yuan. In the same year, Guangdong reviewed and approved 62,633 projects of EIA, approved 57,743 projects and rejected 2,836.

> *"Local governments always put EPB and PEIA institutes in a dilemma situation. We cannot approve the plan, but we have to approve because we understand the difficulties and stress in increasing the GDP and developing the economy; our difficulties in managing the environment without breaking our relations with other government departments are rarely paid enough attention". (G-Q-2)*

In the eastern region, the EPBs have more power of voices than in the western region. As said by one of the managers of EPB in Guangdong, "we emphasize that planning is not environmentally friendly, (thus) the environmental protection will not be good. PEIA is the core. Making industrial and urban planning that coordinates with environmental carrying capability and forms sustainable development with the economy, population, environment and resource would be better to control the environmental pollution from the resources and to receive high attention in provincial government" (G-G-2). As mentioned in the cases, through negotiation, they can persuade the government to carry out SEA and then,

according to the result, EPB can be suggested to the local government to change, or even delete, the plans. In contrast, in Ningxia and Qinghai, the power of the PEIA is very weak, as the local government puts many pressures on the EPB and EIA institutions. With less pressure to stimulate the economic development, the PEIA implementation subjects are more willing to implement the PEIA policy.

Fig.5-4. The pressures the environmental protection department received, according to the vertical government, in government negotiation



Resource: Author drawn according to the interview
Upper line: western region; Bottom line: eastern region

Even though the gap in the power of voices in the western and eastern regions is wide, pressure also occurs at different vertical government levels. Expecting less

pressure from the local government, the gap in the power of the voices of the environmental protection departments in Qinghai and Ningxia in the west and Jiangsu and Guangdong in the eastern region also reflects on the pressure increase at the different administrative levels. The schematic diagram above reflects the pressures the environmental protection department received at different administrative levels. The upper line reflects the pressure the environmental protection departments received from the vertical government in the western region, while the below line is used to reflect the pressure of the different levels of the local government on the eastern environmental protection departments.

We can see from the figure that, at the central government and MEP levels, the benefits of the central government are almost consistent with the MEP in the State Council. Then, the conflicts of the benefits of the local government and the local environmental protection department increase in both the western and eastern regions. The EPB and EPO in the western regions have much more pressure from their upper and same level of government during the government negotiation than their eastern counterparts. Without sufficient policy and strategy support, the Qinghai and Ningxia "environmental protection departments at all levels get great pressure from the same level and high level of government." (G-N-3; E-Q-2)

In the western region, the provincial level EPB starts to have high pressure

from the provincial level government and the rake ratio sharply increases at the city level and, when arriving at the town and country level, the pressure of the increase rate decreases, which means the city level of the EPB has the most pressure from the local government and then the pressure is also very high at the provincial level. The Qinghai and Ningxia governments have negative attitudes of PEIA and just passively react to the national policies. "Project PEIA has been implemented in China for a long time and is accepted by most government leaders, while some government officials still think PEIA is an extension of EIA and never think it is a process should be integrated into the decision-making process" (E-Q-4)

> *"To seek GDP growth and more obvious economic development outcomes, the provincial government wants to have more rights to decide how and what to introduce into the region"(E-N-3) and the "main stress of economic development came from the provincial level" (G-Q-1).*

The situation is different in the eastern region. At the provincial and city levels, the benefits distribution and value of the environmental protection have some kind of agreement between the EPB and the local government. This can be evidenced by the number of plans and the investment of the industrial parks that have been rejected by the local governments in Jiangsu and Guangdong.

> *"The provincial government has paid high attention to the ecological protection. When considering the economic development and attracting outsider investment, the high-tech industries and less environmental impacts have been receiving increasingly more attention" (G-G-1).*

However, the pressure increases at the town and country levels, which is caused by two reasons. Firstly, the town level government leaders and residents still do not place high attention on environmental protection like the city and provincial level governments. In addition, the boom of the large cities and metropolitan areas in Guangzhou and Jiangsu has pushed the flourishing of towns and countries and has provided them with many opportunities of investment and industrial development. The competition for economic development is high. Facing many opportunities in increasing the local economy and increasing their job performance, government leaders sometimes ignore environmental protection and either decrease the PEIA process or tacitly consent to unreasonable industrial park planning.

On 22nd September 2016 the China Office enacted the "Guide advices on vertical management and supervision of environmental protection departments under provincial level pilot work". This guide amplifies the responsibility of the provincial EPB. Although EBPs and EPOs are still subordinate departments of the local government, the new changes provide the provincial level EPB the right of personnel management, appointment and dismissal of environmental department leaders and the financial management of the city level EPB and towns and country EPOs. Jiangsu, Guangdong, Qinghai and the other nine provinces have applied to

become pilot provinces, but only Jiangsu and Guangdong have been approved as yet and have made detailed implementation plans and processes in the "Guiding advices on Jiangsu province construction project EIA reform pilot working" in Jiangsu and the "Advices of Guangdong EPB on strengthening the linkage work of PEIA and construction EIA work" in Guangdong in the year of 2015. This change is expected to decrease the pressure from local government on environmental protection departments, by giving environmental protection departments separate personal and financial management rights. The provincial level EPB is also responsible for the city and town level EPB's duty in environmental supervision. Even though the working process and the pilot provinces have been selected, this change is expected to decrease the power of the local government at the same level. However, whether the power of the voice of environmental protection will increase is still not clear, as the government negotiation process and EPB officials still do not want to have conflicts with other government departments, especially with government leaders they know and have some social connection with, as they do not want to lose face. "In one city, there are more than 20,000 medium and small size enterprises, so how could local (provincial) governments manage them" (G-J-2).

5.5.3 The Different management of SEA institutes, the environmental monitoring quality and the authenticity of monitoring data

1) Management of SEA institutes

Unlike the EIA institutes managed by a qualified system, there is no classification of SEA carrying out an institute qualification system. In a project EIA system, the projects are listed as first-class and second-class, according to the classification system of the EIA institutes and according to "The Environmental Impact Assessment of Construction Project Quality Management Methods" in 2015 and they should only be evaluated by certain kinds of EIA institutes. However, in terms of SEA institutes, even the small size and non-registered institutes and research centers would carry out PEIAs.

"We are one of the registered EIA institutes in our province. Sometimes the local government asks us to give them approval of a plan and we say we cannot and they go to find another unregistered PEIA institute. In order to make money, these institutes make coarse work". (E-N-1)

"The information of the registered SEA institutes is published and recommended on the MEP website. But there still lacks a powerful management system". (E-N-3)

This situation is also the same in Qinghai, where local governments do not pay sufficient attention to the results of PEIAs and allow them to

affect their final decision-making results.

"Our institute is the only first level EIA institute in the province, unless a project EIA, PEIA and other SEA can be done by both registered and unregistered institutes. The country does not have any management regulations and qualified system for SEA institutes or agencies, even though the MEP published a list of recommended SEA institutes on its website. Without reviewing and checking the system of the SEA institutes, a low quality SEA report is connived by EPB to develop the economy. Sometimes we told the EPB institute that we cannot approve the plan,, you know, in the negotiation process, and, instead of letting us carry out the PEIA, they want to find other less qualified institutions". (E-Q-1).

This lack of compulsory management regulations in the SEA institutes is a common issue in both the western and eastern regions. The interviewees in the east also agreed that "the management of institutes carrying out PEIA and SEA is still insufficient" (U-J-1), but "governments still tend to select the recommended institutes with a high reputation" (U-G-2). The gap in the institutes' management is firstly based on the different attitudes of the government and the decision-making agencies in the government are more likely to use an imperfect management system to achieve their targets in approving an industrial park plan, whilst ignoring the environmental protection. In addition, this also results from the different local regulations.

There are no local SEA institutes' assessment policies and regulations

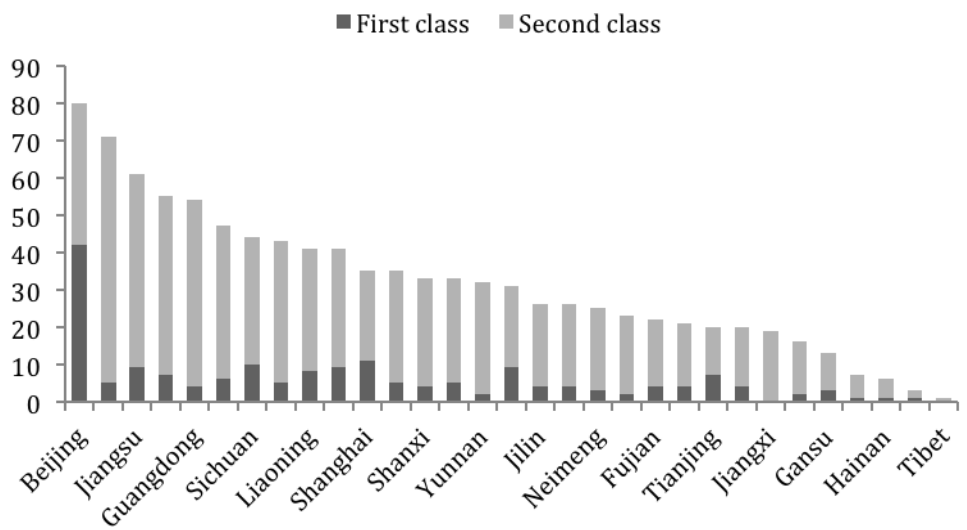
in Ningxia and Qinghai and the main work of the SEA management is based on national "construction EIA qualified management methods", which only emphasize the qualification system of EIA institutes. Jiangsu province published "notices on strengthening the EIA institutes' management and assessment" in 2012 and Guangdong published "the notices of Guangdong province EPB on EIA institutes assessment and management method" in 2015 and explored the range of the EIA report management to PEIA reports. The range of the EIA institutes has to be assessed to cover all institutes working towards carrying out environmental assessment. "PEIAs reports' common assessment performance is determined by reviewing groups"[9]. The average EIS reviewing marks lower than 70/100 scores will be informed, will be criticized, will reduce the scope of the EIA and will cancel the EIA qualification. An EIS that is rejected and returned by the EPB because of its quality of making will lose 3 marks each time. In November 2016, Jiangsu province enacted the "Jiangsu province EIA institutes credit assessment and management Interim measures (for Trial)" and made the

[9]The notices of Guangdong province EPB on EIA institutes assessment and management method

credit information to be integrated into the EIA institutes management system.

In addition, the PEIA institutes' management is also autogenously formed by the completion of PEIA and PEIA marketization. As is shown in Table 5.8, the eastern provinces have significant advantages in the number of registered EIA institutions, both first class and second class. Jiangsu and Guangdong have 61 and 54, respectively. Ningxia and Qinghai have only 7 and 3 certificated institutions of EIA institutes. respectively.

Tab.5-16. The number of registered EIA institutions



Resource: Author drawn according to the MEP data center website: http://datacenter.mep.gov.cn

In practice, the local governments are much more inclined to

delegate to professional institutes, based on the qualification of the PEIA works and the scores of the institutes are published on the EPB website, as said by "how should PEIA be done without a group of exporters, monitoring data and technologies supporting?"(G-G-1)

"Before submitting EIS, we hire some professional EIA institutes with a reputation or who have cooperated with us before. (G-J-2),

Thus, the competition is high. As said by the leader of one Guangdong EIA center:

"Along with social development, EIA institutes in our provinces have to change their mind from the solo environmental issues of a project, especially in Guangdong, which has an early start of economic development. Currently, the requirement of PEIA and SEA has increased significantly. In order to have high competition with other EIA institutes, when carrying out EIA and strengthening the completion of EIA institutes, our main work has to change to the comprehensive consideration of regional environmental quality and the security of the ecological system. In our institute, more than 60% of EIAs are relative to PEIAs and other SEAs, such as the cement industry development environmental impact assessment and urban planning of new urban regions" (E-G-1).

Based on their high human resources and investments' support,

"Our (eastern) province EIA institutions commonly cooperate with those institutes with advanced PEIA research, such as Zhongshan University and provincial environmental technology institutes, and initiatively carry out SEA theories, technologies, methodology and cases, an index system and an implementation process based on the Guangdong economic and social development strategy" (E-G-2).

2) Management monitoring quality and monitoring data

Similar to institutions' management, the PEIA implementation outcomes are also influenced by the dual monitoring quality and monitoring data of the two regions. An accurate and broad scope is essential to assess the impacts and analysis. SEA methodology is heavily dependent on the amount of the data of the research areas and the quality of the data. For example, GIS analysis is based on remote sensing images and many calculations are performed with statistical methods relying on previous statistical data.

A larger scope of data could be able to provide a more comprehensive appraisal to cover a broader range of negative and positive impacts.

In the year of 2014, Jiangsu province enacted the "Jiangsu social environmental monitoring institutes monitoring ability qualified management methods (trial)" and allowed social environmental monitoring institutes and compressive monitoring institutes to undertake environmental quality monitoring work after passing the environmental monitoring ability qualifying check. The first list of the "social environmental monitoring institutes name list passing the environmental monitoring ability checking (first list)" was published in 2015.

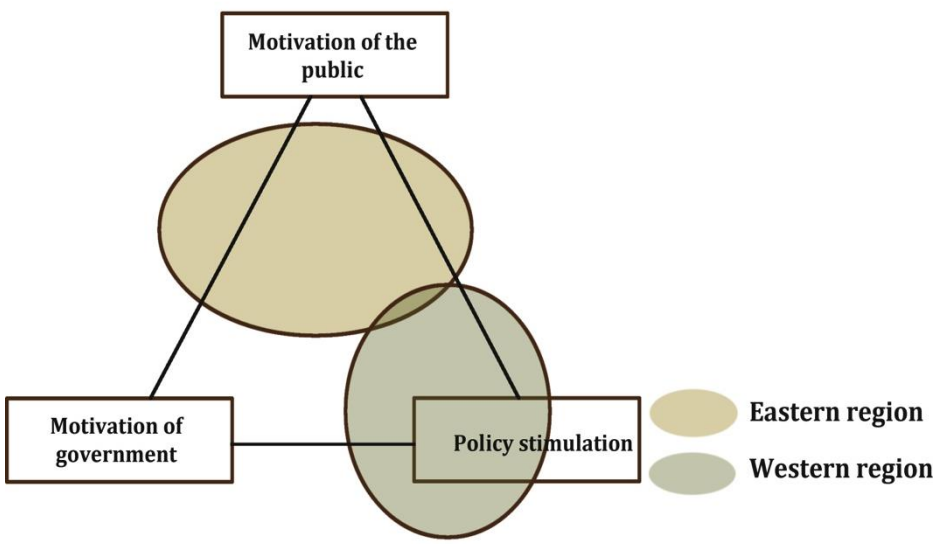
In the same year, the provinces published the "further illustration of province EIA environment present situation monitoring" and further managed the EIA data by putting forward that the "environmental monitoring institutes and

comprehensive monitoring institutes should correctly cite their monitoring and be responsible for current data" and the "EIA documents should attach a checking report of the qualification of the environmental monitoring institutes and the illustration of the historical data and be responsible for true historical data".

> *"It is society governed by law; the data is the voice of talking. Without self-used monitoring groups, how should EPB enforce the law" (G-J-1)*

5.5.4 Different motivation and form of public participation

Fig.5-5. The motivation triangle of organizing the public participation



Resource: Author drawn according to the interviewee

In the SEA process, a minimum number of the public and experts are required when "deciding on the scope and level of the details of SEA" (Schmidt, Joao, and Albrecht, 2006). The public who are weak 'can cause the SEA process to weaken

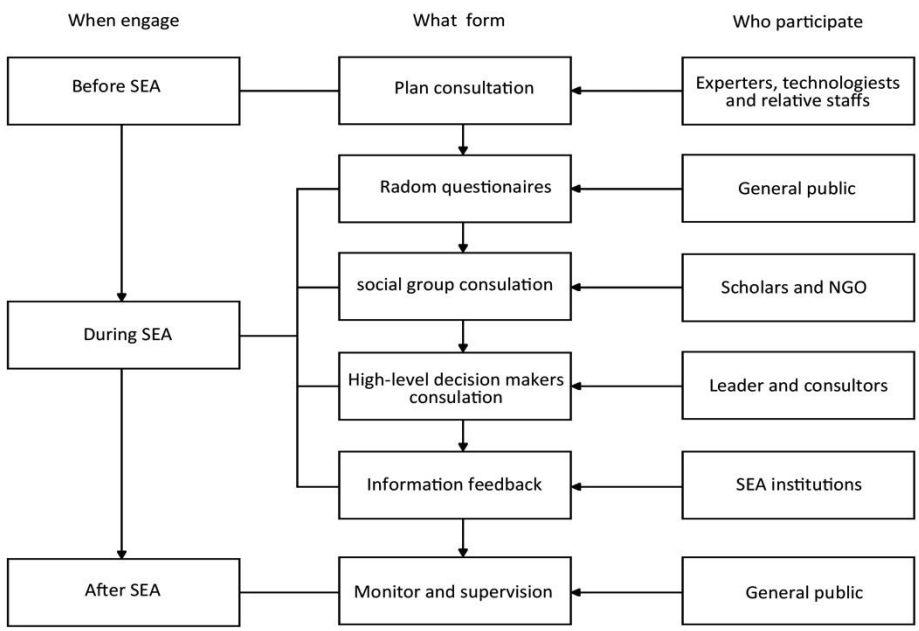
as well. How to make the public integrate into public participation process is an international question. However, unlike EIA, which has a clear range of people getting involved, the SEA process involves a larger amount of the public, who may have, or have not, direct exposure to the impacts. A less broader range of the public engaged leads to weak public participation in both the western and eastern regions. As mentioned in Chapter three, public participation could be motivated by government policy requirements, the governments' willingness to hear public voices and the cognition of the public and their willingness to engage. The figure shows the motivation triangle of public participation. There are three elements that influence the motivation of public participation in PEIA: the subjective willingness to participate (such as the stakeholders may like to show their views in the plan), the motivation of the government (the willingness of the government to organize the public and to increase the hearing of governments) and the policies' requirement. According to the interview, the research found that the western and eastern regions have different motivation in organizing the public participation in the PEIA process. Even though wide public engagement is the guarantee for a successful PEIA implementation and can open the views of the decision-makers to the issues they had not considered.

According to Liu and Wang (2005), in their research in 2005, 41.7% of PEIAs

did not have public participation and all of them did not provide a chapter for public reading in their EISs. The public participation was restricted to the early investment stage and the public had no way of expressing their views after finishing the EIS and attending the final review. Ten years later, after the publishing of the "People's Republic of China Government Information Disclosure Regulations" and "Environmental Information Disclosure Measures (for Trial), public participation is becoming a compulsory process of PEIA. The technological guidance of PEIA mentions the forms of public participation. However, there is no regulation regarding the process of the public participation in SEA in China now. The released "Interim Measures for the Public Participation in EIA" in 2006 is limited to the field of project EIAs. When public participation should be engaged in SEA, who should be involved, what form is selected, which subject is responsible for the organizing and how should the public participation response be dealt with are the five main questions related to public participation in SEA. Li, You and Ren (2012) mentioned the framework of public participation in SEA (see Figure 7-1). The public should be involved as early as possible (Therivel, 2004) and be engaged in each process of SEA. Experts, technologists and relative staff, the general public, scholars and NGOs, leaders and consultants and staff from the SEA institution should all be included. Without the requirement to publish the full contents of the

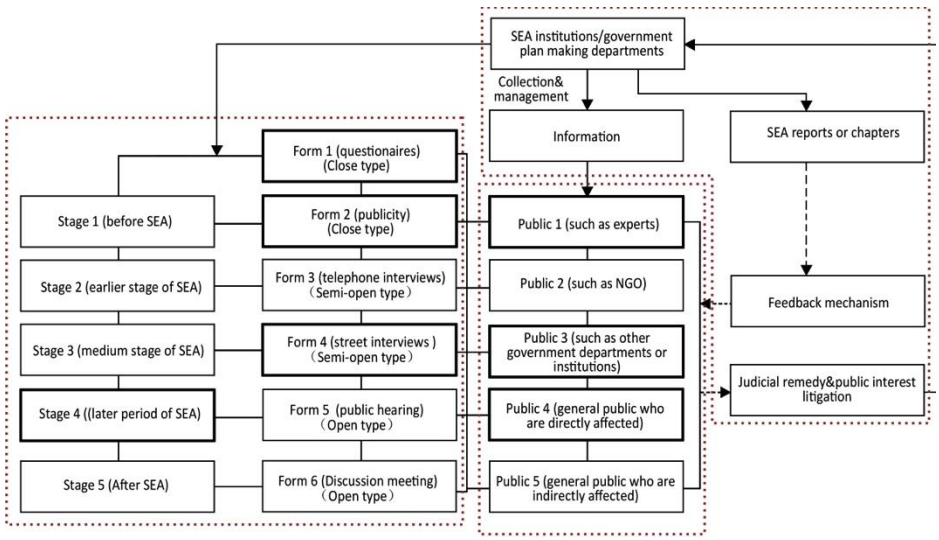
PEIA report, this research argues that, in the PEIA, the public participation process can be summarized as: “in the first step, the EIS publicly displays on the EPB/EPO and the local government official website. Official notices are posted in the involved areas if necessary” (G-N-1, G-N-2, G-Q-1, G-E-2, I-J-1, G-U-2, G-U-2). “Then, questionnaires are submitted to the residents involved” (G-N-2, E-N-2, G-E-2, I-J-1, G-U-2,). However, listening and discussion meetings are rarely used.

Fig.5-6. The public participation framework



Resource: Li, You and Ren (2012)

Fig. 5-17. The public participation framework in reality in the western region



Resource: Author drawn

Most residents in Ningxia and Qinghai obviously stick to the traditional ideology of "relying on the government" and do not recognize their right to speak in the EIA process. Even though it is a plan or program related to their own interests, the people who are willing to participate in a public option survey are also very few. For example, from the interview, it became known that only two households wanted to participate in public surveys when the environmental impact assessors performed their field work during "The overall PEIA of the wool textile industrial park of JinJi, Wuzhong city, of Ningxia province". which was produced in the year of 2010. The other residents did not want to express their views, thought it was the task of the government and that the general public did not have the necessity to attend, or did not trust the public survey results, and were not willing

to express their true views (E-N-2). Without receiving the views of the general public and stakeholders, the SEA in the western region merely follows the traditional way of EIA in evaluating the environmental impacts and largely relies on quantitative calculations or solely uses the experts' views, as the main constitutions of advices cannot be fully achieved.

In Qinghai, some industries, water conservancy and hydroelectricity facilities in an industrial park plan and river basin development plan are built in remote ethnic-minority concentrated areas.

> *"The local residents have their own languages and texts. The information and other government documents provided on the website written in Chinese cannot be obtained by them" (G-Q-2).*

The EIA experts can neither talk with the indigenous people nor conduct an interview with them during the fieldwork and early investigation. Even though, sometimes, the EIA institutions hire some translators to help them obtain the advices of the local residents, the validity decreases. The residents are more unlikely to engage in the SEA process (E-Q-2 and G-Q-3).

In addition, the public is limited to considering the short-term interest compensation of individuals and social groups, instead of long-term environmental benefits. As mentioned above, most industrial parks in Qinghai and Ningxia are located in the remote rural areas and involve a less amount of people. The land to

construct the industrial park is mainly brought by the government.

> *"In practice, the public does not pay much attention to environmental pollution. Instead, they focus more on how much money they can receive from the government. If they can receive sufficient money, they can even move, no matter where. " (E-N-3)*

Furthermore, they also "mix their attitudes towards the industrial plan and its environmental impacts with their attitudes towards government compensation" (E-Q-1). This means that, when asked for their advices regarding the ecological impacts of the plan, they do not want to say no if they receive enough government compensation for the loss of land or for moving. "They do not have the ideology of environmental protection or the ideology that the government would like to integrate them into the plan making" (E-Q-1).

However, the low education level of the citizens and the lack of a sense of environmental protection are regarded as key reasons for the insufficient public participation. In fact, the mistakes in the process making and in the government are always hidden by the low education level of the public, with the public being blamed for the irresponsibility of the government. As is shows in Table 5-7, although all PEIAs have a public participation process, none of them in Qinghai and Ningixia have organized a listening and discussion meeting. One of the interviewees (N-G-3) mentioned that "the province PEIA has sufficient public

participation, because the 'PEIA results are published on the official website and sometimes posted on a notice broad in the surrounding areas, and they can complain by appealing to the higher authorities for help". However, in practice, "the public wanting to initiatively be involved in public participation is very rare. You can see from the official website that the page views are quite limited and there are almost no responses" (U-J-2). The government leaders lack knowledge of the SEA principles and even judge their performance according to the basic right of the citizens.

On the other hand, as is shown in the front cases, public participation is implemented much better in Jiangsu and Guangdong. the EIA institutions currently have a more cautious and careful attitude towards organizing public participation in Jiangsu and Guangdong, as the environmental issues can cause more serious problems related to influence in these areas and the governments are more afraid of the complaints of the general public who have a much higher environmental awareness. As said by I-J-1, "the public participation in our province is strictly implemented in accordance with national requirements. At first, the development zones' PEIAs are published on the website of the EIA institution and we found that the page views' volume is very low. It is then required to be published on the website of the local government. Questionnaires are compulsive in the PEIA

process",

> *"Hearing and discussion conferences can avoid further complaints from the public" (E-G-1)*

In addition, although previously a phenomenon existed that EIA institutes carried out interviews with a certain group of people and used the opinions of individuals to present the views of the general public, in 2012, the MEP promulgated "the notice of strengthening risk prevention and EIA management" and required the environmental departments to pay more attention to the public participation situation at the period of the EIA report examination and approval. The notice also required the environmental protection departments to deeply examine "the legality of the process, the validity of the form, the representativeness of the object and the validity of the results" of the public participation (G-G-1). In this circumstance, although the governments consider it as time costing, they are still willing to organize public participation. In the developed provinces, the mistakes in the programming emerge as late intervention time, close-type forms, lack of participation of the NGO, the general public who are indirectly affected, the feedback mechanism and the judicial remedy and public interest litigation.

Also, under the pressure of the local government or the affects of their personal relationship with other government leaders and the traditional bureaucratic views that are stronger in the western region than in the eastern region, the EIA

agencies cannot remain neutral when evaluating the environment impacts of the industrial park and organizing public participation. Lacking the respect of democracy, it is not seldom seen for PEIA agencies to view public participation as unfair. To“Take a hydroelectricity exploration development plan as an example, in early 2005, a batch of scientists and scholars in Beijing were invited by the provincial government to conduct field work at a river and they all agreed to approve the construction of a hydroelectric power station. This was due to the province only inviting exporters who always hold positive views about a hydropower station and they did not invite those who always have a critical view” (E-Q-1.)

> *“After collecting the voices of the public, sometimes we will review them and throw away some opposing questionnaires and add some votes with supporting advices, and, you know, it is safe sometimes, because surveys are anonymous. Of course, another way, and recently, real-name reporting will be carefully considered, but in our province, in the field of PEIA, real-name reporting is rare” (E-Q-4)*

5.5.5 Investment supports of PEIA and human resource support

Unlike EIA, SEA involves a much broader evaluation range and much more index, including direct environmental impacts, indirect environmental impacts and cumulative impacts. The ability of the different regions strongly influences the outcomes of SEA. One of the most significant gaps in the quality of PEIA

evaluation in the western and eastern regions is the ability gap, which is caused by the duality on personal policy and the lack of well treated staff, knowledge and techniques and finance.

One of the significant disadvantages of the western region is the scarcity of experts. The personal policy in the western and eastern regions leads to a concentration of talented people in the east and a loss of labor resources in the western region. One interviewee, who is the leader of one leading EIA institution in the western region, said

> *"We are facing an issue of hiring a high technique and well-educated person. Our institutions become self-supporting departments and the salary in the institution in our province is much lower than in the same level of department in the eastern region. Most students are more likely to go to the big cities for good job opportunities" (E-N-2)*

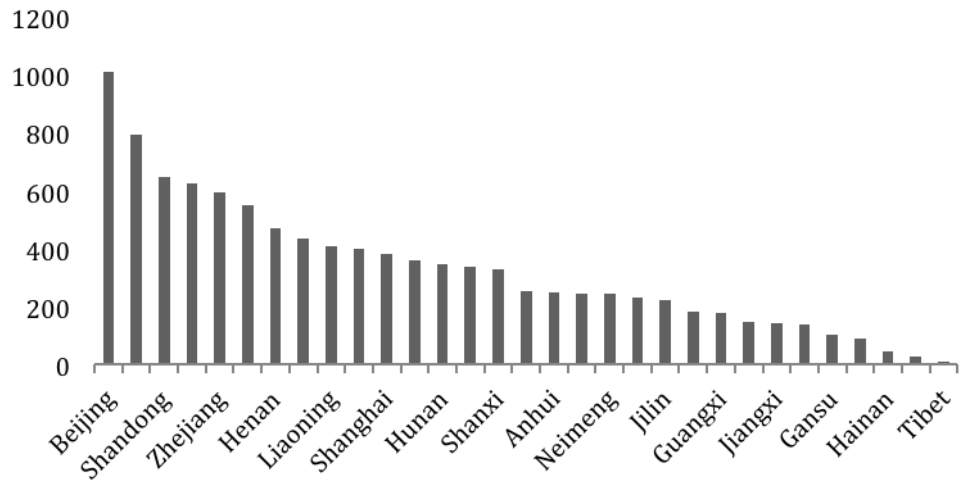
In contrast, the institutions in the eastern province are inclined to agree that they have enough labor sources, although not sufficient. The quality of staff and their skills to deal with complex social, economic and environmental issues are also a challenge for the eastern institutions. As said by E-J-3,"Every year we have campus recruitment in the Jiangsu provinces and surrounding provinces, such as Zhejiang, Hunan and Hubei, and could receive hundreds of resumes. So the completion is high. I don't think human resource is the large problem in our institutions. Compared with the EIA institutions in other provinces, we have more

programs and offer high salaries. We still prefer more (labor resources) with professional knowledge and experience in the field of SEA"

> *"I knew some SEA institutes in some provinces have less qualification requirements and SEA institutes evaluation regulations argue that the SEA institutions' staff do not require a higher level of education and the SEA report could be written according to the existing mounted pattern. But, as a way to prevent environmental issues at an early stage, if the quality of the SEA staff cannot be guaranteed, how would we implement a valid EIA. In our institutes, all the EIA staff members have a university degree and 70% of them have a Master's degree" (E-G-2).*

The following figure shows the number of registered EIA engineers and registered EIA institutions in the different provinces until the 1st October 2016. It is obvious that the gap in registered EIA engineers is extremely broad among the different regions. Jiangsu and Guangdong have 792 and 546 registered EIA engineers, respectively, and rank at the top of the country. The number is only 24 in Qinghai and 88 in Ningxia.

Tab. 5-18. The number of registered EIA engineers



Resource: Author drawn according to the MEP data center website: http://datacenter.mep.gov.cn

Since all the SEA institutions have now been separated from government departments and have become self-supporting departments, the incomes of the institutions depend on the PEIAs they carry out. Without the large amount of PEIA projects, the incomes of the SEA institutions cannot provide high salaries for their staff. "The location and the individuals are different issues. Remote regions and the areas with low regional finance incomes have less investment and PEIAs, and the incomes of the SEA institutions are definitely low" (U-J-2).

> *"In Nanjing city, almost all of the SEA institutions recruit staffs with a salary higher than 15,000 RMB per month", but in Yinchuan and Qinghai, "the salary is from 3,000 RMB to 6,000 RMB per month. There are many example of staff previously working in the eastern region, moving back to our cities for a while and then moving back again" (E-Q-2).*

A high salary, more equality in promotion opportunities, an open and feasible working environment and less bureaucratic management system, and other talent absorbing the preferential policy, create an increasing number of students. The EIA team in Qinghai and Ningxia province is relatively weak with a limited number of experts. The only first class registered EIA institution in Qinghai, the Qinghai Academy of Environmental Science, has 45 staff members and only three of them have a Master's degree or higher, and 19 of them have medium and higher positional titles. The first class registered EIA institution, Nanjing University Environmental Design and Research Institution, has 26% of its staff with a doctoral degree, 38% of staff with a Master's degree and 56% of them have medium and higher positional titles. Among the 192 staff members in the Jiangsu provincial Academy of Environmental Science, the staff members with a doctoral degree and Master's degree account for 35 and 75, respectively, and ten staff members graduated from international study or work experience. However, according to former NEPA national statistics in 2003, there were more than 10 thousand plans formulated and completed by governments and departments above the city level. In carrying out PEIA for more than 10 thousand plans, the first problem is the shortage of human resources (Wu and Jiang, 2006). Compared with the large amount of workload, the eastern region is still seeking more registered and high-

skilled SEA workers.

In addition, the lack of professional knowledge and technological skill is another gap. Compared with EIA, SEA requires a higher level of technological level and broader range of knowledge. There were some high-polluting industries introduced to industrial parks with the approval of EPB central that caused serious environmental accidents, because of the incorrect evaluation result from the improper evaluation result made by the staff members who lacked sufficient technological skills and responsibility (Luo, 2002).

In the western region, the technologic support of PEIA is not sufficient and, thus. an insufficient amount of support is provided for the planning-making department (Wang, 2009). Some of the employees engaged in PEIA do not know many of the methods and principles of SEA.

> *"In our provinces, the EIA institutions do more project EIAs and only a small number of experts have the experience of evaluating development plans. I don't think about their technological skill level; I just tell you and you may not believe that in our first class institution, no one knows how to use GIS". (E-N-1)*

In practice, "after some short term training for PEIA before the practical work, they are still influenced by the traditional thinking of construction project EIA and still follow the procedures and methods of EIA". As said by (Qiao et al., 2010), without sufficient professional knowledge and understanding of regional development

PEIA, some of the SEA staff in Qinghai are unable to grasp the direction of PEIA or make the evaluation content and the key issues are fuzzy. The lack of higher education staff will lead to a misunderstanding of SEA principles, insufficient technology and skills to deal with SEA project and hesitance to implement the policy. SEA and EIA implemented at different scales and SEA should focus on the key issues and the capacity of the region and should not be detailed (Schmidt, etc., 2006), but heavy reliance on the traditional EIA methods and quantitative results ignore the complex influence of the plans for social and cultural development.

The situation is much better in Jiangsu and Shanghai. As mentioned above, the education and research centers of the region play an important role in stimulating the SEA development and legislation of Jiangsu and Guangdong. Even though "It is the period to improve and perfect the technology and methods of SEA in the process of SEA implementation in China, we have much more experiences than the western areas and the pilot studies" (U-G-3).

The EIA institutions and local environmental protection departments in Jiangsu and Guangdong are the pioneers in making the state environmental protection law, amending environmental regulations and becoming the centers for environmental policy and technology innovation. For instance, Nanjing University environmental design and research institution is one of the main departments

engaged in hosting or participating in the revision of a number of state environmental standards (“Technical method for gas pollutant emission standards GB/T3840-91”and "Taihu Lake urban sewage treatment plants and key industrial sectors of the main water pollutant emission limits of DB32/T1072 - 2007") and is engaged in the making and reviewing of the technological guidance of EIA. “Shenzhen Academic Environmental Science” introduced several advanced mathematical simulation models from abroad, such as the ADMS mathematical simulation atmospheric model, WASP water quality model and CADNA/A digital noise model mathematical model, as well as the ERDAS remote sensing explanation software. The institution has the most advanced GIS graphics workstation in the world and a high-speed network system. The Jiangsu Provincial Academy of Environmental Science has several patents on tail water treatment technology for industrial park wastewater treatment plants. Facing the technological gap, the EIA institutions and research centers of Jiangsu and Guangzhou are, on one hand, engaged in making and reviewing the technological guidance of PEIA, so as to bridge the gap in technological skills and provide a guide of SEA skills and methods to the western provinces, where the innovation of EIA technology is low. Qinghai and Ningxia, on the other hand, passively accept and learn the methods and skills, but cannot fully understand and use them after

some training.

> *"Considering the local higher education, even though it is the very important resource of the EIA institution, in our province (Ningxia), Ningxia University is a high level education institution providing a major in environment and resource. However, they do not have a major of EIA or Master's or doctoral courses. In addition, the top universities in the ranking of environmental science majors are all located in east China". (G-N-3)*

The training of SEA professional staff is very important (Wu and Jiang, 2006). This issue also results from the SEA training in different regions. Located in a more developed region, the SEA staff and environmental protection government in the eastern region have more opportunities to have training and communication with the neighboring provinces. Through an interview, the EPB organizes a meeting or classes for the officials around two to four times per month by hiring some experts to give lectures. At the same time, SEA institutions have academic seminars or experience sharing once or twice per month in Jiangsu and Guangdong. Based on the more creative research circumstance and abundant resources of high-education, the environmental science research centers, as well as its subordinated EIA institution, have more initiatives on holdings meeting and seminars to share experiences. The frequency of training and studying in the government environmental protection departments in Qinghai and Ningxia is similar to their eastern counterparts, but the most commonly used form is studying the government

documents. There are less academic seminars and experience sharing of SEA knowledge in the EIA institutions. A short training is always organized before starting the PEIA, in order to implement the PEIA work successfully. Most of the time, the training and education is provided for the purpose of introducing the SEA methods and process to ensure the carrying out of the PEIA. Instead of academic seminars and meetings, the SEA institutions organize staff to go to other providers to learn from their experiences, especially before carrying out the evaluations.

Local finance ability is another important element causing the gap in the SEA implementation of SEA. The interviewees agree that some PEIAs cost more than 50,000 RMB and there is no significant difference between the provinces and almost all of the PEIA fees exceed 30,000 RMB. Currently,the PEIA fees of all the provinces occupy around 10% of the cost of the planning making, which is higher than the international level of 7% (Sun, 2008). This becomes one of the reasons why PEIA has not been widely popularized and is intervened in the early stages. The PEIA making department generally improperly evaluates the environmental impacts of the planning as deep as the traditional EIA causes a high cost. “The successful carrying out of PEIA cannot be achieved without the financial support of the local government, the support of the development zone management

committees and the environmental protection monitoring center, in terms of data and equipment and price negotiation with the SEA institutions". (U-G-1)

> *"This is because, in the environmental management field, it is general to have larger input than output. The benefits that can be got from the environmental project are very small. Except for the environmental protection consulting and environmental protection technology service industry, who can achieve profits, other industries are generally in a state of loss". (G-G-2)*

The gap in the local finance ability of the western and eastern regions is obvious, because of the gap in the economic development standards and revenue income. For the undeveloped areas, the high costs of fully implementing SEA are a fiscal burden. The law of EIA finally deleted the requirement of "considering the alternatives and selecting the proper one" during asking for an advice period and, because of this, it is argued that this increases costs.

In order to make up the financial deficit of the undeveloped areas, to balance the financial gap between the regions and to achieve an equalization of the basic public service ability of the regions, the central government has arranged a subsidy expenditure for the undeveloped areas. The central subsidy expenditure has more flexibility for the local government to use. In addition, the central government has specific funds to support the achievement of specific macroeconomic policies and career development strategic targets in the fields of education, health care, social

security, agriculture, environmental protection and other public services. For example, in 2013, Ningxia received 9.73 million Yuan from the central government to construct an environmental air condition monitoring network and to increase their ability to monitor PM2.5, O3 and CO3, which indirectly brings more available data to SEA. However

"Our government is almost an 'all-round government' and has a lot of responsibility. Money has to be spent on various kinds of fields. The fields related to improving the living standards of the residents have the highest priority to receive financial support, such as education, medicine and social services. The environmental protection and SEAs, and their long-term benefits, are always underestimated by the government" (G-Q-1) and "even if the local government has received the money from the central government through finance transfer from the developed regions, this money does not get used in SEA" (G-N-3)

Except for some specific funds for environmental protection, direct government investment on environmental protection is very rare in the western region and, until now, there are no government specific funds for SEA in the Ningxia and Qinghai provinces. Instead of avoiding the high costs of a PEIA of the development zone development plans by being hesitant to carry out PEIA, or simply PEIA content, in Qinghai and Ningxia, the EPB and government leaders are

more willing to carry out PEIA and deal with the costs through negotiation.

5.5.6 Intervention time, alternatives andadministrative misbehaviors' penalty in the PEIA process

The early invention time of SEA has been mentioned in almost all of the SEA technical guidelines and regulations, such as the technical guidelines for PEIA general principles (2003), technique guides for provincial land use master planning PEIA (2005), technique guides for regulation for EIA of river basin planning (2006) and technical guidelines for PEIA-Onshore oil and natural gas field general exploitation and development plan (2008). The technical guidelines for PEIA general principles mentioned that the PEIA should be integrated into the planning-making process early.

During the plan compendium formulation period, the planning-making department should delegate EIA institutions to collect the data, search and review the relative laws and regulations and start the fieldwork and preliminary analysis to confirm the main categories of the environmental impacts and select the environmental restricted elements and then provide feedback to the planning making agencies. At the time of planning the research, the EIA institutions should start the resource, environmental and ecological analysis, and the forecast and

assessment. Generally, this includes the analysis and evaluation of the environmental factors (water and air, for instance), resource and environmental carrying capacity, cleaner production and public health and environmental risk analysis. The conclusion and suggestions of the EIA should be fed back to the planning-making agencies. During the planning making period, the EIA institution should put forward mitigation measures, optimization and adjustment suggestions, or suggestions to give up the plan. An environmental feasible plan and alternatives at the strategic level should be suggested. If the suggestions are not accepted by the planning making department, then adjustments should be advised to meet the management's requirements. Before applying for approval, the SEA statement should be submitted and before the plan is submitted for approval, the EIS should have been completed and approved by the PEIA reviewing departments and sent for the planning examination at the same time.

The law of EIA implemented on 1st September 2016 changed the invention time of the project EIA mentioned in the previous version of the law of EIA promulgated in 2003. The requirement that "EIA should be approved by EPB or EPO firstly and then other procedures, such as the approval of the construction program, can be carried out" was deleted and replaced with "project EIA and project construction can apply for approval at the same time" to "improve

efficiency and decrease the time cost of the approval of project" (Zhang, 2016). However, this reverses the article in the law of EIA promulgated in 2003 and requires that the EIS of PEIA should make an analysis, prediction and assessment of the environmental impact caused by the implementation of the plan and put forward countermeasures and measures to prevent, or mitigate, the adverse environmental impact, as part of a draft plan submitted to the planning authority for examination and approval. For these plans, without writing the draft of the chapter or providing an explanation of the environmental impact, the examination and approval authorities will not approve them.

However, in practice, it is common to have PEIA after the construction of the economic development zones and industrial parks. Liu and Wang (2005) researched 12 recently carried out regional development PEIA cases and found that only 25% of the PEIAs related to regional development plans started at the period of planning making and 47.1% of them started after the detailed regional planning, which makes the function sharply decrease, because PEIA finds it hard to use its veto to implement the plans. 33.3% of the PEIAs started as a regional development constructing, or using, period, and the principles of using PEIA as a tool for improving strategic action change the final results of the strategic actions and increase the participation of stakeholders to open the views of the decision-makers

who were against it. There are two cases to show the invention time in the western regions.

During the research, the gap in the invention time of PEIA also exists in the western and eastern regions. The interviewees in both Ningxia and Qinghai also agreed that the PEIA work in Ningxia and Qinghai provinces integrated the planning making process much later.

> *"Currently the intervention of almost all PEIAs has been started or completed after the forming of plans in Qinghai and PEIA has not been fully integrated into the plans produced and the optimization process of plan making and can only put forward some mitigation suggestions" (G-Q-2).*

One example mentioned by an interviewee is the PEIA of the Datong River Basin by E-Q-4. At the time when the Datong River Basin PEIA was made in 2008, among 13-cascade hydropower stations were planned to be constructed in the river basin. However, before carrying out the PEIA, 12 of them had been constructed, or were under construction. This argument is also confirmed by the interviewees in Ningxia province.

> *"In most situations, it starts in order to satisfy the MEP's and central government's requirements. I have been working in EIA agencies for more than ten years and we don't have many practices starting SEA before the construction of projects. Our province has almost none. If you want some examples, you should go to other provinces" (E-N-2.)*

Even though late invention time commonly exists in both Ningxia and Qinghai in

the western region and Guangzhou and Jiangsu in the eastern region, in the eastern region PEIA starting at the policy-making stage is not difficult to see. *"Although there is no statistical data, there are many PEIAs starting at the planning-making stage. It is regulated."(G-G-2).* Nanjing, as the capital city of Jiangsu, enacted a land bid invitation, auction and listing of SEA systems in 2010 and implemented the SEAs of 43 real estate development sites and put forward land repair, layout adjusting and other pollution control requirements towards 8 plots of land.

> *"The government is gradually more likely to apply for PEIA at the planning making stage to avoid further complaints of environmental pollution and issues, even though some industries and investment have to be abandoned" (J-U-2).*

The gap in the PEIA implementation time could also be verified by statistics. According to the China Environment Yearbook, at the end of 2012,the rate of industrial parks and economic development zones carrying out PEIA was only 35% in Ningxia[10]. Two years earlier, in 2010, nine out of the 11 newly built economic development zones submitted a PEIA in Guangdong and 59 of the 92 provincial economic development zones had completed PEIA reviews, Three had submitted their PEIA document by the end of 2010, which accounted for 67.4% of all the economic development zone[11]. In the year of 2012, Nanjing city, the capital of

[10]China Environment Yearbook 2014

[11]China Environment Yearbook 2011

Jiangsu, had combined EIA with PEIA and made sure that the newly built economic zones had 100% completed their PEIA[12]. In 2013, six newly built economic development zones also had their PEIA before approval of their EDZ plan. By the end of 2015, 90 out of 93 provincial level economic development zones in Jiangsu had been carried out in the planning of EIA and they occupied 96.8% of all the economic development zones. 50% of the provincial level economic development zones completed their tracking evaluation (Wang, et al, 2016). From the implementation of the environmental impact assessment law in 2003 to the end of 2015, there were 113 approvals for a master plan for a coal mining area in Jiangsu province, and 52 of them were approved without completing PEIA. The early intervention of the coal mining areas master plan PEIAs occupied 54% of all the plans. "Until now, almost all the industrial parks and economic development zones in Jiangsu have completed their PEIA and a large amount of them have also carried out a follow-up evaluation. Almost all of the newly built industrial parks currently make their plans at the same time of making their PEIA" (J-I-1).

The early invention time of PEIA in the eastern region is firstly based on the local regulations and mechanism. In the only regulation published in Ningxia

[12]China Environment Yearbook 2014

towards PEIA, named "The notice of the general office of the autonomous regional people's government on further strengthening the work of PEIA", only one sentence below the chapter title states that "The task and time limitation of carrying out PEIA" is "until 2016, all established 31 industrial parks without carrying out PEIA would make a PEIA report and make sure the implementation rate of the PEIA reached 100%". In the same year, the MEP enacted a policy named "advices on strengthening the linkage work of PEIA and EIA" and argued that, in order to strengthen the cooperation between PEIA and EIA, it is necessary to decrease the workload of the project EIA and strengthen the role of PEIA in guiding and restricting the PEIA and implementing the results of the PEIA in EIA in the economic zone and industrial parks and to implement the role of the beforehand prevention environmental management methods and the PEIA and EIA in preventing environmental pollution and ecological damages. The result of the PEIA is based on the project EIA and, according to the PEIA results, the evaluation process and degree of EIA of the new projects constructed in the planning range that had PEIA will decrease. The linkage work highlights the importance of PEIA and the priority to implement PEIA work. According to the MEP policy, environmental protection departments should improve the quality of PEIA and pay full attention to the role PEIA and engage in an early planning making process. However, the range of the linkage work of PEIA

and EIA is only suitable for "key regions that have completed the main tasks of PEIA". Until now, neither Qinghai nor Ningxia environmental protection departments have mentioned the implementation of the linkage work of PEIA and EIA in practices or published documents. Guangdong implemented the link work of PEIA and EIA as early as 2010 and the government document named "advices on environmental protection work in promoting the economic development pattern transformation of the provinces" put forward the requirement to make the regional and industrial PEIA the important foundation for the approval of a project EIA document and for carrying out key industries and regional exploration development PEIA to guide the rational provincial industrial layout. In 2015, the "Advices of Guangdong EPB on 'strengthening the linkage work of PEIA and construction EIA work' and the "Letter of Guangdong EPB on the advices of industrial park PEIA list management' and linkage work with EIA pilot work plan" were published in succession to further strengthen the role of PEIA. In Jiangsu, "along with the improving of PEIA and EIA linkage work, the phenomenon of 'getting on the bus first and paying for the ticket later' (xian shang che zai mai piao; approve the EDZ plan first and then complement) in practices is decreasing a lot and early invention of PEIA and the results of PEIA are also considered as the basis for decreasing the process of EIA" (U-G-3). In October 2016, the Jiangsu government published the

"Jiangsu Province construction EIA reform pilot methods" and selected several national level EDZs' EIA in Changzhou, Yancheng, Kunshan, Zhangjiagang, Jiangyin and Rugao as pilot works, to strengthen the role of PEIA on layout optimizing, to structure change and promote industrial transformation and to simplify the EIA process in the range of PEIA. Except for the advices on implementation of the linkage work of PEIA and EIA policy, the policies strengthen the PEIA management and the work of PEIA also leaves less space for the illegal behavior of late inventions of PEIA. "The process of PEIA in Guangdong has been detailed and regulated further, based on the state laws and regulations" (G-G-1). Jiangsu also "makes detailed and operable policies to regulate the invention time and increase the power of punishment" (E-J-3). "Along with the increasing attention and working degree of the PEIA in the central government, a series of regulations and advices have been made and the early invention time of PEIA has been reaffirmed and the replenished PEIA documents after completing an industrial park or industrial plan are increasingly unacceptable" (G-J-2).

In addition, this gap also results from the implementation gap, in terms of the attention of the environment protection of the local government and the financial support. "The cost of PEIA is generally paid by the planning-making agencies,

which are generally the government or relevant departments"(U-J-1). Currently, for these projects and plans that supplement the EIA and SEA formalities after the construction and operation, the EPB basically holds the accepted attitudes. Although they cannot evaluate the environmental impact before construction, it is a better approach than doing nothing. The Government maintains the stance of protecting and supporting the enterprises and the development of the local economy, thus EPB only has to strengthen the prevention and control of the pollution efforts, based on the selected location of the project and existing plans, instead of implementing a systemic evaluation. This is contrary to the principles of SEA to predict and evaluate the environmental impact in the early stages and is only able to put forward some countermeasures to prevent, or mitigate, the adverse environmental impact that is caused and to prevent the happening of pollution incidents in the future by the project construction.

In general, PEIA is more likely to integrate into the planning making process in the eastern region, because the sentence "(we did it) as it is regulated in law and regulations" (U-G-2 and J-G-2 for example) has been mentioned several times. Both government officials and experts in the SEA institutions have more respect for the regulations and legislation, which is also reflected by the lesser influence of the personal views of government leaders and stronger power of the voice of the

SEAs.In addition, PEIA requires a long making time and high technology requirements. Thus, the fees are very high. The Qinghai and Ninngxia governments are now facing the shortness of financial funds and it is hard to find a solution for resources of funding, which is one of the main reasons for the delay of PEIA. Now, the question of the fees for an SEA application is a sensitive question and some interviewees do not want to talk about this. As mentioned in Chapter five, there is no regulation about the range of consultation fees of SEA, but the range for one plan can be from 100,000 Yuan to 1,100,000 Yuan in general,

> *"It will not be less than 300,000 for one plan, because it involves a large number of people and technological support. Because most development and industrial plans are made by the government, the payment for SEA will be a serious burden to the local finance" (I-N-1)*

Compared with the provincial incomes of Qinghai and Ningxia, whose numbers are 25.2 billion and 34.0 billion Yuan, respectively, Jiangsu (723.3 billion Yuan) and Guangdong (806.5 billion Yuan) have around a 30 times higher financial income. Thus, the financial difficulty is not an obvious barrier of the early intervention of PEIA. Jiangsu and Guangzhou have a much higher population density, so the construction of one industrial park could have an influence on more people than in the eastern regions. "Local governments are more willing to listen to the advices of the EPBs before the implementation of plans, in order to decrease the risk of potential complaints and litigations" (G-

U-1; G-E-2). The environmental awareness increase also results from the high environmental pollution in these areas. Even though the environmental issues have been transferring from the eastern region to the western region, the environmental condition in the eastern region is not optimistic. The economic development without considering the environmental impacts in the long period causes eastern China to become a disaster areas of air pollution, acid rain and water pollution. For example, the serious haze accident that happened on 2nd, December to 14th December 2013 covered almost all provinces in the eastern and central regions. The air condition of several cities, such as Tianjin, Hebei, Shandong, Jiangsu, Zhejiang and Shanghai, was ranked at pollution level six. The PM2.5 in Shanghai reached 700 mg/m3 and above on 6th December. The area that had the most serious haze pollution is located in the mid-south of Jiangsu. The air quality of the capital city of Nanjing was categorized as serious pollution for five consecutive days and categorized as severe pollution for nine days. The instantaneous PM2.5 density at 11 o'clock on December 3rd reached 943 micrograms / cubic meter. However, in their western counterparts, the

"PEIAs are implemented because they are required to be done for a purpose, such as completing work or applying for or attract more investment from the central government or investors. For example, one economic development zone carried out PEIA after several industrial

parks had been implemented for more than five years, in order to upgrade the development zone level from a city to a province" (E-N-1).

This can also be seen from the government requirement. On June 2016, the Ningxia local government issued a "notice on accelerating the development of industrial park PEIA work" that required the industrial parks that had not started or completed PEIA to produce PEIA, submit the EIS report and apply for reviewing, to ensure that the implementation rate of the industrial parks' PEIA was 100% before the end of 2016. As said by G-N-3 "we speed up the construction of PEIA and plan to complete the PEIA work of all the industrial parks in our region". On one hand, this reflects the government's determination of carrying out SEA at overall provinces and encourages the improvement of SEA work. On the other hand, carrying out PEIA for the proposal to finish the target misunderstands the function and principles of SEA and does not intergrade SEA with real practice work.

In addition, in terms of alternatives, the gap in the western and eastern regions is also very wide, as mentioned by Elsa João (Schmidt, etc., 2006). The success of SEA is largely dependent on the types and qualification of the alternatives considered. Refusal to add policies in SEA bans many innovative alternatives from being implemented in real practices, since "un-SEAed national policies do not provide local and regional level decision-makers with an acceptable, sustainable

framework for their decisions" (Thérivel 2004). Turning to the alternatives, as mentioned above, although in the legislation system there is no article that compulsory requires considering the alternatives, the technological guidance of PEIA and law of EIA suggest providing alternatives, in order to optimize and select the most suitable plans. Sun (2008) submitted 158 questionnaires of planning to SEA institutions and received 42 efficient questionnaires. Even though the response rate was only 26.6%, which may affect the credibility of the results, the research shows that 76% of the participants think that SEA considers the alternatives in their practices. Turning to the types of alternatives, the "non-action" plan, and new plans suggested by SEA and other plans provided by a plan draft, account for 24%, 32% and 44%, respectively. In this research, the author found that there are also gaps in the alternatives. In the interviews, the common views of the interviewees in the EIA institutions, experts and university professors are that considering alternatives is an important factor in the SEA process in western countries and should be paid high attention to in China.

> *"I mentioned several times to the local government, EPB and EIA institutes that considering the alternatives is the core in the SEA system in the western countries and that our country should pay more attention to thinking about alternative plans in SEA, considering the alternatives are still lacking inChina's SEA process" (U-J-2)*

In the eastern region, "although there are requirements of providing

alternatives, the industrial park planning making agencies do not carry them out them voluntary." (G-E-1). "There are some plan making agencies that make one or two alternatives and bring them to our (PEIA intuitions) or delegate SEA institutions to make alternatives, but this does not happen often. Most of the time, alternatives are only provided when the plan of the development zone would like to be changed and the economic zones would like to introduce new industries or some mitigation measures to reduce the environmental impact" (E-J-3). One example is that "one industrial park in Xuanan, Guangdong wanted to introduce one LCD screen industry from Taiwan after making the plan. Thus, in order to change the original plan to the new one, the management committee of the development zones provided the adjusted plans to the PEIA institutions as an alternatives" (G-E-1) "But there is no overturning alternatives at the current stage to change the original plan"(U-J-1), but in practices, the EPB and SEA institutions also have the power to cancel the plan or have a "zero" plan if the plan is viewed as causing significant negative environmental impact on the government negotiation. "One industrial park was designed to be built in the headwaters of Taihu Lack and wasd finally cancelled in the process of carrying out the SEA", as said by an EIA expert from Jiangsu Province (E-J-1). However, because of the lack of a clear legislation illustration, there was a less valid public participation platform and the government

leaders look down on the process to integrate stakeholders in the decision-making process. Instead of engaging a wide range of public participation and providing alternatives to the decision makers, China's PEIA is based on environmental carrying capacity and environmental restrictions, as mentioned above. Thus, the relative policy supporting of alternatives is rare. Almost none of the PEIAs in Ningxia and Qinghai provide alternatives.

> *"I know considering alternatives is an important part in SEA, but none of the PEIAs have provided alternatives. Evena 'zero' plan is rare because of the role of EIA institutes on rejecting EDZ or industrial plans is limited. Thinking of alternatives is considered as a waste of time by most of government leaders." (E-N-3)*

In the aspects of government responsibility and administrative misbehaviors penalty in the SEA process, as discussed before, China's environmental protection law provides a crude guide of the illegal responsibility without detailed penalty information. Local environmental protection ordinances in different provinces provide more clear, but different, penalties forof misbehaviors in the SEA process. For example, in the different environmental protection ordinances without carrying out EIA and starting to construct the project without authorization, the penalties are different among the provinces, such as in Xining they will charged 10,000 Yuan to 100,000 and in Guangdong, they are not only charged 100,000 to 200,000 Yuan, but are also required to recover the original land shape during to PEIA. Thus, both

EPB or EPO and PEIA institutions in Jiangsu and Guangdong have more respect for the law and encourage and carry out PEIA more seriously, according to the requirements. Expecting a high power of penalty, Jiangsu and Guangdong provinces also have their own support and management regulations of PEIA institutes. For instance, to further regulate public participation, the provincial EPB public opinions department will randomly select 10% of the questionnaires to recheck the public views towards significant, sensitive and well-known PEIA reports and surprise the process, methods and requirement of hearing conferences and penalize misbehaviors[13]. For the EIA institutes whose EISs are rejected twice in a year, the annul assessment is considered as unfair.[14] Dishonest institutes in Jiangsu province will be given 3-6 months time to reform and cannot accept the evaluation work during this period.

The EIA agencies renting or faking qualification certificates to carry out EIA and PEIA work beyond the level of qualification will make rectifications within a one to three year limit and cannot carry on evaluation work in this period. The managers and PEIA staffs who are irresponsible or are fake in carrying out reports will be circularized a criticism and will make rectifications within a one to three

[13]Advices on actually strength EIA environmental protection public participation of Jiangsu province

[14]"The notices of further strengthen EIA institute management of Jiangsu province"

year limit and cannot carry on evaluation work in this period.

5.5.7 Common issues

There is no that gaps in the environmental management policies and regulations lead to different environmental protection outcomes. For example, according to the China Environmental Statistic Yearbook, from 2014 to 2015, the COD discharge in decrease 2.9% in 2015 over 2014 at national level and the amount of Nitrogen discharge decrease 3.18%. In Jiangsu province, the COD and Nitrogen discharge decrease 3.03% and 2.73% respectively, and the number in Guangdong 3.74% and 4.49%. The most numbers of COD and Nitrogen discharge decrease rates are higher or similar with national average level. The COD discharge and Nitrogen in Ningxia only decrease 1.18% and 0.04%. Instead of decreasing, the COD discharge and Nitrogen in Qinghai increase 1.69% and 2.98%.

Even though the gaps of SEA implementation between Guangzhou and Jiangsu and Ningxia and Qinghai are wide, they have common issues. Under the same legislation system and institutional framework, in general, the laws of EIA and technological guidance have some imperfections, such as containing no requirement on the decision-making departments and having to accept the suggestion of SEA, as mentioned in Chapter four. The government negotiation make the successfully of SEA implementation strong depending on the opinions of a small group of people, especially the government leaders. The fragmented

government structures further weaken the ability of the EPB/EPO. Even though the vertical environmental protection department reform is planned, the implementation process and effectiveness is still unknown. In general, the local government and EPB that are responsible for the EIS reviewing and the environmental issues monitoring is a group sharing the same benefits. The intervention time of PEIA is commonly late, because decision making agencies do not want to pay the high fee for environmental assessment before approval of the plan; the project is a large-size and a high investment project encouraged by the governmentand there are specific conflicts between the government departments, especially at the town level. The implementation outcomes could change along with more ecological protection regulations.

In addition, government leaders have more positive views of PEIA implementation and easily ignore some issues that occur at the practical level. Some government leaders, especially in the western region, have limited knowledge of the principles and meaning of SEA and still adhere to PEIA implementation with the traditional project. This is partly because the government leaders alternate the system, which means the government leader changes his or her position after holding a post for years. This means that the president of the EPB and EPO may have been the vice-president of other government departments (a

financial department for instance). The lack of knowledge and recognition of SEA results in, in practices, some government leaders holding the positive views towards the PEIA outcomes and hide the issues behind them. For instance, some government leaders think that public participation in PEIA is good, because they published the results of PEIA and the basic information of the plan to the official website, but they are inclined to ignore the issues, in that the click rate of the government official website is very low and without reading whole EISs, the public, and even the experts, cannot judge the performance of PEIAs easily. Some local people involved may not understand the language used on the website. Local governments enacting the policies to regulate all the existing industrial parks to complete the PEIA by the end of 2016 in Ningxia reflects that the government pays more attention to the surface formality and ignores the significance of PEIA in preventing environment issues and the early invention of PEIA. These issues are also caused by the lack of policies and regulations. Although the eastern regions have more advantages in policy innovation and are more active in environmental management policymaking, both the western and eastern regions are facing implementation issues, especially at the district and town level.

5.6 Summary of PEIA implementation

Tab.5-19. Different PEIA implementation in the western and eastern regions

		Western region		Eastern region	
Value of environmental protection		Economic development		Ecological civilization	
Trends		Weak	Strong	Weak	Strong
Local PEIA polices	EPB/EPO				
	SEA institutes.				
Voice of EPB/EPO	EPB/EPO				
	SEA institutes.				
Management of PEIA	EPB/EPO				
	SEA institutes.				
Monitoring quality and data	EPB/EPO				
	SEA institutes.				
Valid of public participation	EPB/EPO				
	SEA institutes.				
Form of public participation	EPB/EPO				
	SEA institutes.				
Financial and human resource	EPB/EPO				
	SEA institutes				
Administrative	EPB/EPO				

penalty	SEA institutes.				

Resource: Author drawn according to the results of the interview

EPB/EPO means interviewees from EPB/EPO; SEA institutes means interviewees from SEA institutes

In general, the eastern region has an obviously better performance in nine items of PEIA implementation in the nine aspects discussed in the research, according to both the environmental protection department staff and the SEA institutes' staff (Table 5-19). The gaps are even broader in the valuation of environmental protection, local PEIA policies, the validity of the public participation and financial and human resources support, as shown in the figure. The western provinces face significant disadvantages and strong barriers of PEIA implementation in almost all of the items, putting too much value on economic development, imperfect local PEIA policies, the weakness of the power of the voice of the environmental protection departments in government negotiation, weak management of PEIA, less valid public participation and the imperfect public participation forms. Some strong advantages leading to successful PEIA implementation are: give an important value of environmental protection and relative complete local PEIA policies, the financial and human resource and valid public participation. These four elements guarantee successful PEIA

implementation in the eastern region and the barriers of the implementation of PEIA in the western region.

In addition, the views of the officials in the environmental protection department and the engineers in SEA are also different. In general, the government workers in EPB and EPO have more positive views of PEIA implementation than the EIA institute staff. The gap is much broader in the western region. In the three aspects named as the form of public participation, financial and human resources and the monitoring quality and data supporting, the views of the government workers and EIA institutes are even opposite. For example, local government leaders think they have well accessible environmental monitoring data and other statistic data, while the EIA institutes have a negative attitude towards the quality and range of the data, especially the historical data and the continuity of the environmental data. In addition, the Ningxia and Qinghai environmental protection governments feel that they pay sufficient attention to organizing the public participation, while the EIA institutes hold obviously opposing points of views and agree that the forms of public participation lack flexibility and operability. Another gap in the view of PEIA implementation between the western government and EIA institutes is the financial and human resource support. Most of the interviewees in the western government emphasized that the local government, especially the

environmental protection departments, have received central government financial support for environmental management and environmental construction project implementation, while the EIA institutes argue that the high cost of PEIA is considered as one of the main reasons for the hesitancy in implementing PEIA in the early stages, because the local governments are the all-round government and the finance of PEIA has the lowest priority in implementation. The lack of PEIA engineers and well-educated staff (human resource) is also mentioned by the EIA institutes, because of reasons such as the less local high education system and less attraction to talented people.

In the eastern provinces, the views towards PEIA implementation of the government and EIA institutes are much more similar in most of the items, especially in the value of economic development, effectiveness of public participation and financial and human resource support. The management of PEIA in states is the only element in Jiangsu and Guangdong that government officers and PEIA institutes have adverse views towards. Even though the government officers argued that both national and local regulations and laws have been enacted to further regulate the performance of the PEIA institutes, such as the publicity of the credit information of the EIA institutes and the PEIA report reviewing and marking system, the EIA institutes argue that, since there is no qualified system of

PEIA and SEA institutes' management system, like the project EIA, the quality of the PEIAs cannot be ensured if they are done by institutes without certification. Also, the environmental protection department leaders hold more positive views of monitoring quality and the form of public participation. This is because, according to the existing regulation of PEIA, the compulsory forms of public participation are restricted to passive forms, such as being open to the public, and there is a lack of active forms that the public can truly engaged with in the decision-making process. Government leaders always agree that they organize the public participation work to conform to national regulations and provide some certain ways for stake-holders to encourage the public to engage in the decision making, while the EIA institute staff have more knowledge of the principles of SEA and the differences between the traditional project EIA and SEA.

The figure below shows the relationships and the degree of two elements, policies and policy implementation, and their effects on the PEIA implementation outcomes. The items in the green box reflect the aspects of the PEIA outcomes caused by less perfect policies and regulations supporting, the items in the shadowed box reflects the items with weak implementation and the yellow box reflects the items that are influenced by both weak policy implementation and imperfect policies. In general, the western region has more items of PEIA

implementation that have both weak policies and regulations supporting and weak policy implementation and they are: the high value of economic development and low value of environmental protection, less attention to PEIA, weak SEA institutes' management and imperfect form of public participation. The one item in Jiangsu and Guangdong that has less power of policies and degree of policy implementation is the form of public participation. In contrast, all of the five items that have relatively completed policies and regulation supporting and good implementation existing in the eastern PEIA implementation are high value of environmental protection, positive attitude of PEIA, monitoring quality and authenticity of monitoring data, valid public participation and administrative penalty. Similar to Figure 5-8, which shows that the eastern regions have more successful PEIA implementation outcomes, the eastern regions have a more mature policy system and better PEIA implementation.

Tab.5-20.The influence of policy implementation and policies on PEIA outcomes in western and eastern region

		Western region		Eastern region	
Influences		Weak/imperfect	Strong/perfect	Weak/imperfect	Strong/perfect
Environmental	Policies				

protection motivation	Implementation				
Attitudes to PEIA	Policies				
	Implementation				
Government negotiation	Policies				
	Implementation				
SEA institutes management	Policies				
	Implementation				
Monitoring quality & authenticity	Policies				
	Implementation				
Valid of public participation	Policies				
	Implementation				
Forms of public participation	Policies				
	Implementation				
Financial & human resource support	Policies				
	Implementation				
Administrative penalty	Policies				
	Implementation				
Invention time and process of PEIA	Policies				
	Implementation				

Resource：Author drawn according to the results of the interview

Tab.5-21.The influence of policy implementation and policies on PEIA outcomes

Items	Valid policy & perfect implementation	Valid policy &imperfectimplementation	Invalid policy & perfect implementation	Invalid policy &imperfectimplementation
West	-	Quality and authenticity of monitoring data; valid of public participation; financial and human resource support; administrative penalty; Invention time and process of PEIA	-	Form of public participation

East	Motivation of environmental protection; Positive attitudes to PEIA; Valid public participation; Quality and authenticity of monitoring data; Administrativepenalty	Financial and human resource support	Government negotiation; SEA institutes management; Invention time and process	Motivation of environmental protection; Positive attitudes to PEIA; Valid government negotiation; SEA institutes management; Form of public participation;

Resource：adjust according to Tab.5 -20

In addition, it can be seen that, within the ten fields and the total of 20 items in both the western and eastern regions, there are eight elements that are strongly affected by the policy implementation and they are: government negotiation in both the eastern and western regions, SEA institutes' management of the eastern region, monitoring quality and authenticity of the monitoring data, validity of the public participation and the form of public participation in the eastern region. Ten items

received more influence caused by the supporting of polices and they are the value of environmental protection, attitudes towards PEIA, monitoring and monitoring data, validity of public participation, financial and human resources, PEIA misbehaviors' penalty and invention time and process of PEIA in the western region and attitudes towards PEIA, financial and human resource support and administrative penalty. Two items are influenced by similar influences. One is the positive value of the environmental protection in Jiangsu and Guangdong that is affected by both the national strategy and the aims to build a moderately prosperous society and sustainable development and the attention of the environmental protection of the PEIA implementation subjects. Another one is the relatively weak SEA institutes' management in the western region that is caused by both the lack of SEA institutes qualified certification management and decision-makers holding a perfunctory view of PEIA, or would like to affect the PEIA result by giving pressure to the SEA institutes.

In general, the PEIA implementation results in the eastern region are influenced more by policy implementation and the implementation results in the western regions are deeply affected by the policies in the western region. This is because, in the eastern region, most of the research items (six out of ten) have relatively mature policy supporting and, thus, the policy implementation becomes

the determined element of the PEIA results. For the items with imperfect policies, the implementation degrees are also very high, because of the social and economic development, the ideas of the government leaders and the ability and supervision mechanism mentioned before. Unlike the successful PEIA implementation outcomes in the eastern region depending either on sufficient policies' supporting or good implementation performance, the problems of the PEIA implementation outcomes in the western region are firstly based on less valid and sufficient policies. In addition, it can be seen that the performances of the PEIA implementation in the western region have both the low policy supporting and the PEIA policy implementation in Ningxia and Qinghai provinces and the results coordinate with the imperfect implementation results in Figure 5-8, as discussed above. In contrast, the research elements of the PEIA in Jiangsu and Guangdong are distribution and are mainly far away from the apex, which means they have good performances.

Chapter six: conclusion

As said by G-J-1, “if the government drives a car, then the Development and Reform Commission and Economic and Information Work Committee are accelerators and the environmental protection departments are brakes. When to push the accelerator and when to push the brakes is determined by drivers, instead of being determined by the accelerator and brakes.”

The research focus on the gap existing in the social and economic development in western and eastern China is caused by the national strategy to invest all the countries’ resources in some regions and to allow some people to get rich first after the economic reform and “hokou” system after the establishment of the PRC analysis under the different policy making and policy implementation circumstances. The research emphasizes the gap in policy making and regulation innovation between western and eastern China, including policy innovation, public administration, governance and public participation, and different government negotiations and the gap in policy implementation includes the implementation subjects’ ideology, motivation and benefits balances, vertical government management and horizontal government negotiation and ability, especially the human resources and financial support and the supervision. This research found that “dual” environmental management policies, PEIA policies and PEIA

supporting policies provide the most contributions to the "dual" PEIA implementation outcomes. The PEIA polices are relative to the invention times and the process of PEIA, human resource support, the value of environmental protection and the validity of the public participation in the eastern region results in a more successful process of PEIA implementation in the eastern region. The eastern region also further regulates the PEIA institutes and monitoring of data. Imperfect SEA laws and regulation systems lead to some common issues in the SEA implementation process, as well as the value of the environmental protection and the governments' attitudes to PEIA. In the eastern regions, although the policies and regulations have some imperfections and insufficiency, they provide a basic, but detailed, management of the PEIA system and support and encourage the government leaders' ideology of environmental protection and their attention to PEIA and other advantages of the implementation results in the successful PEIAs in the eastern region.

The successful practices of SEA in Suzhou and Guangzhou verify the feasibility of SEA. China's negotiation government provides different pictures of SEA circumstances that can provide experiences to other developing countries and the countries without traditional and cultural democracy.

The implementation deviation of SEA in the western region is represented by

Ningxia and Qinghai and reflects successful SEA, depending on many elements (such as the support of government leaders, high skilled EIA institution, powerful supervision and participation of the public, etc.) that do not exist in all areas. The issues of incomplete and cautious SEA legislation and regulation system and fragmented government framework become more obvious in these areas. The unsuccessful implementation of the developing regions is not merely reflected on policies, but also on ideology and economic foundation.

The feedback from SEA practices is extremely important for improving the coverage and practicability of the law system and providing detailed guidance. For developing regions, the author advises providing some feasible and effective methods during the transition period from EIA to SEA, such as starting from some specific fields, such as an industrial park, development zone and river basin PEIA, by offering detailed guidance and serious supervision and making niche targeting local regulations to protect the implementation of SEA. There are some good PEIA examples in Jiangsu and Guangzhou that coincide with SEA proposals and principles. Some common characteristics of them include: (1) they have more respect for regulations and roles; (2) in the circumstance that governments are structured by a negotiation process, the successful carrying out of SEA cannot be achieved without the support of the local government and an awareness of the

environmental protection of government leaders. The public could stimulate a more environmentally friendly planning-making process and, thus, the public participation should not stay at the surface, nor be replaced by experts' views.

This research tries to fill the gap in the existing research as there remains no research that analyses the duality in China's environmental policies and environmental policy implementation, even though the duality between China's western and eastern regions, in terms of economic and social development, have been receiving great attention and is considered as one of the challenges that China will face in the following decades. The different reaction speeds on national policies and more marketed-based and flexible policy innovation policies lead to much broader, creative and detailed regulations and policies to support the PEIA implementation. The influences that affect policy implementation, such as the ideology of the implementation subjects (the attitudes of government leaders or balance of the interests, etc.) and the ability, are also reflected in the different outcomes of PEIA in the western and eastern parts. This research emphasizes that, even though both PEIA and other environmental management policies and policy implementation influence the outcomes of PEIA implementation, the dual policies and regulations significantly affect the government leaders' attitudes to PEIA, the power of the EPB and EIA institutes in government negotiation and other

supporting policies. In the aspect of policy implementation, the government leaders' attitudes toward environmental protection and PEIA agencies, the local governments' development targets and strategies are more important than other elements. In the eastern region, with more detailed management and supporting polices being made, the results of the PEIAs are much more valid than in the western region. Supported by the policies, the issues of policy implementation are not as obvious as in the western region. However, interviewing is the main method of this paper and the different PEIA results are judged by the power of the voice of EPB/EPO, management of PEIA, monitoring quality and data, the validity and forms of public participation, financial and human resources to support the PEIA, administrative penalties and the invention time and consideration of alternatives. Some issues are hidden in the gap existing between PEIA implementation and the actual industrial parks planned and built. As said by one interviewee

"I cannot tell you whether the PEIA in our province is poor, but you can find it if you go to the industrial park to see". (G-N-2)

To view and analyze one or two unreasonable industrial park plans and their PEIA approval processes would provide a more detailed picture of the PEIA implementation outcomes and the games the different government agencies play.

However, although the author tries to avoid bias by informing them that no personal information is disclosed and that no information in the paper could be

used to track them, asking the same questions more than once and trying to not guide them in the interview and allowing them to talk, the research is relative to the performance of the government and the issues in the government working and what has been done above in other countries, in conducting the interviews, for example, some of the interviewees kept changing their views, bringing difficulty to the research. In addition, although this research wants to show the dual PEIA implementation in China under the same policy framework to extend the research of PEIA from the developed countries to the developing countries and to reflect the gap in the PEIA implementation between the developed and undeveloped regions, China, however, has some unique political circumstances and is deeply influenced by its history culture and development. In addition, the contribution of this research to the developing regions is mainly concentrated on policy-making, instead of policy implementation, because the different regions have different backgrounds to implement the policies. More research on this topic should be performed in the future.

Reference

Barrow C. J., 1997, Environmental and Social Impact Assessment, Arnold, London, 1997.

Bai Y, several issues relative to the policy support of China Western Development, Reform of Economic System, vol.1 2000,10-16

Bao C., Lin J., Chen Y. and Li T., 2013. Sustainability-oriented technical standard system for strategic environmental assessment in China: based on analysis effectiveness of Technical Guidelines for Plan EIA (on trial, HJ/T130-2003). Journal of Urban Planning. Vol.2 23-31.

Bao G, Liu B, Zhou Y and Zhou Y, 2007 vol.4 11-15, Analysis of the development gap between the East and the west of China from the perspective of governance innovation of local government, Journal of Beijing Administrative College, vol.4 11-15.

Boyce, C. and Neale, P., 2006. CONDUCTING IN-DEPTH INTERVIEWS: A Guide for Designing and Conducting In-Depth Interviews for Evaluation Input.

Bram. F. 2004 SEA Quality assurance: evaluating and improving the consistency of judgments in assessment panels. Environmental impact assessment review, 2004, (24):3-25

Breukers, S. and Wolsink, M., 2007. Wind power implementation in changing institutional landscapes: an international comparison. Energy policy, 35(5). pp.2737-2750.

Briffett, C., 1999. Environmental impact assessment in Southeast Asia. Geojournal, 49(3), pp.333-338.

Briffett, C., Obbard, J. P., & Mackee, J., 2003. Towards SEA for the developing nations of Asia. Environmental Impact Assessment Review, 23(2), 171-196.

Cai S., 2009, Several issues on completing environmental impact assessment law system, Environmental Pollution and Control, Vol.12, 12-17.

Cai W, 2006, Research on the gap between the East and the West, Statistics and Consultation, 2006(6):34-35

Cai Z and Dou L, 2006, Journal of BUPT (Social Sciences Edition) Vol. 8, No.3, A comparative analysis of the system factors of economic growth in China's Eastern and Western areas.34-38

Chaker, A., El-Fadl, K., Chamas, L., & Hatjian, B. (2006). A review of strategic environmental assessment in 12 selected countries. Environmental Impact Assessment Review, 26(1), 15-56.

Che, X., Shang, J. and Wang, J., 2002. Strategic environmental assessment and it development in China. Environmental Impact Assessment Review, 22(2), pp.101-109.

Chen F., Li X., Dong L. and Hai R., 2008. Initially analyze EIA follow-up assessment implementation mechanism. Environment pollution and prevention. Vol. 30, 97-100.

Chen J, 2015, Study of unified atmospheric environment standards of key regions, Southwest University of Political Science and Law, Master

Chen X., 2008. Thesis and case study on regional planning environmental impact following assessment. Beijing University of Chemical Technology. Beijing. Master.

Chen Y, 2002., China's western economy: institutional shortage and assistance
Economic Research Reference, (42):11-19

Chen, Y, 2007. An analysis of current statues, causes and effect of regional disequilibrium of economic growth. Journal of Guizhou Nationalities University, 2, 25-29.

Chen, Y.N., Chen, H.M., Huang, W. and Ching, R.K., 2006. E-government strategies in developed and developing countries: An implementation framework and case study. Journal of Global Information Management, 14(1), p.23.

Cui S, 2015. An analysis of performance different of eastern and western environmental responsibility in China Harbin Institute of Technology, master

Deng D, On the non-balanced of systems arrangement between the West and the East and the innovation of systems of the West, Exploration, 2001 Vol.1, 100-104

Deng, Y, 2009. The environmental pollution problem of undertaking industrial transfer in less developed areas. Huxiang Forum, 124, 122-123.

Dongan Environmental Protection Office, Interpretation of the new "environmental protection law" six highlights, Qilu Evening News, 2015.6.04. http://epaper.qlwb.com.cn/qlwb/content/20150604/ArticelZ11002FM.htm

Dong M., 2011.The influence of environmental regulation on China industries international competition, doctor degree. Graduate School of Chinese Academy of Social Sciences.

Fang B., 2014. Study on the legal system of strategic enviornmental impact assessment in China. Hunan Normal Univeristy. Changsha. Master.

Feng Changlin, Crowded big cities: rich and poor, "two China" brings 8 big problems, 2014.05.13, http://www.topnews9.com/article_20140513_37068.html

Fischer, T.B. and Gazzola, P., 2006. SEA effectiveness criteria—equally valid in all countries? The case of Italy. Environmental Impact Assessment Review, 26(4), pp.396-409.

Gao B, 2003, vol. 4. The interaction between the East and the West in the process of China's modernization, Southeast Academic Research, 96-102

Gao D, Tang Y, Feng N and Zhou K., 2013, 5 35-40, Jianghuai Tribune, Research on the policy of promotion the regional industrial transfer in China

Glasson, J., Therivel, R. and Chadwick, A., 2013. Introduction to environmental impact assessment. Routledge.

Geng, H., 2009, The discussion on improving China's strategic environmental assessment system, Environmental Pollution and Control, Vol 31, 85-88

Gong L, 2011, Regional Analysis of Chinese infrastructure output effect, Master of Economics, Nanjing University of Finance and Economics

Gui, B., Zhong, W., and Sun, L., 2004, Strategic environmental assessment and item environment assessment. Transportation Standardization. Vol. 10. 16-20

Han S, The political analysis of the development gap between the eastern region, Journal of Chongqing University of Science and Technology (Social Sciences Edition) Vol.1 2008 9-10

Han, Z., 2011, Investigation on the pollution of chromium residue in Qujing, Yunnan Political Consultative Conference News, 2011.08.22005.

He D. and Qian X., 2000. Study on relation between strategic environmental assessment and sustainable development. Chongqing Environment Science, Vol. 22, 20-22

He Q., 2014. Research on the system of the object of environmental impact assessment. Northwest A & F University. Master.

Hong H., 2009. Protect planning environmental impact assessment with legal system-analyze the planning environmental impact assessment ordinance. Hunan Normal University. Changsha. Master.

Huang F. 2008. EIA for the first time "physical examination": 1.5 trillion-pollution projects "dismount".
2008-11-20. Http://hb.newssc.org/system/2008/11/20/011299171.shtml.

Huang Z, 2001, Southwestern University of Finance and Economics, master
Huang, Z. and Palvia, P., 2001. ERP implementation issues in advanced and developing

countries. Business process management journal, 7(3), pp.276-284.

Ji Qiang, Comprehensive development level of Jiangsu province rank top one in China, the central people's government of the PRC, http://www.gov.cn/gzdt/2013-02/22/content_2337755.htm

Jing H. and Lin Zhao., 2004. The research on alternatives in planning environmental impact assessment. Environmental Science Trends. Vol.1 11-13

Jiang X (2013)Research on the route choice of undertaking industrial transfer and policy orientation for Hubei province, 2013, doctor.

Kang, Y, 2002. The legal mechanism of environmental resources protection and sustainable development in Western China. Tianshui School of Administration Academic Journal, 16, 47-49.

Lan F, 2009, How different location determinations affect FDI in west and east China: based on the purpose of promoting FDI in west China, master dissertation, Southwestern University of Finance and Economics

Lawrence, D.P., 2003. Environmental impact assessment. John Wiley & Sons, Inc..

Lee, N. and George, C. eds., 2013. Environmental assessment in developing and transitional countries: principles, methods and practice. John Wiley & Sons.

Li A. and Hu C., 2004, The comparative study on strategy environmental impact assessment system between America and China. Presentday Law Science,Vol.2 109-120

Li, A. and Peng, L., 2008. The system of strategic enviornemtnal assessment: the legal system guarantee of the ecology of economic development mode, Green Economy, Vol. 11, 72-77.

Li M and Liu J, A study on the westward migration of enterprises based on the development of the Western and Central China, Gansu Social Sciences, 2011, Vol.1 218-222

Li G and Guo H, The summary of the Chinese Non-governmental organization research in recent years, 2011 Vol 12 13-18, Institution

Li, J., 2008. Environmental impact assessments in developing countries: An opportunity for greater environmental security. USAID FESS.

Li, X, Zhao, S and Zhao, G, the influence of the adjustment of the national higher education policy to local universities in central western China in the recent two decades, Journal of Henan University (Social Science) 2016, Vol.56, No.2 ， 15-24

Li Y., 2015. An analysis of the problems in promoting the administration by law at the basic level government. Essays Monthly: Academic Edition. Vol.5 76

Li, Z., Ju, M., Shi, T., Chen, M.and Li, B., 2004, A study on indicator systems for strategic environmental assessment on transport planning, Transport Environmental Protection, Vol 25, 16-26.

Lin, B, 2014. West China development should avoid environmental pollution transfer. West China Development, 01-02, 72-75.

Liu C., 2013. The improvement of enviorment impact assessment law based on the objects of EIA, Ocean University of China, Qingdao. Master

Lin L., and Liu S, Diagnose the west-east disparity, West Forun, Vol.11, 15-19, 2005

Liu J, 2008, Develop of rural hydropower to improve the livelihood of the people in rural areas without electricity, China Water Resources, 2008(6): 25-27

Liu J, 2011, Double international currency system: formation and trends, China Opening Journal, Vol155, 41-56

Liu Z and Li J, 1985, Population Theory Tutorial, China Renmin University Press

Lu Feng, 2004, Shanghai master, Spatial statistical analysis of regional economic disparity in China, East China Normal University

Lu, X, The gap of development between east and west, and the new ideas on west development, 2001 Journal of Tibet University, Vol.16. No.2 ， 12-16

Luo Z, 2013. Study on undertaking industrial transfer policy in Western China, Lanzhou Academic Journal, 06, 92-98.

Ma L. and Li Y., 2003. Initial study of strategic environmental assessment on revision of country level traveling region’s general planning of Dianchi Lake in Kunming. Yunnan Environmental Science. Vol.1 6-8

Mao H, Strengthen the construction of the infrastructure to narrow the gap between the West and East, "Energy base construction", 1996 (5): 47-48.

Meng Q. and Cui L., 2004. The discussion on definition, screening and analysis of alternatives for planning environmental impact assessment. Environmental Protection of Xinjiang. Vol.3 23-27

Ouyang Xiaoguan, Guo Fen, Zhan Cunwei and Chen Fan, 2013 Vol.2,ecological economy, Suggestions on improving PEIA validity in development districts. P171-174.

Patnaik S.C. and Chen Yao, Economic development duality, Development Research, 1990, Vol. 3 54-59

Partidario, M. R. (1996). Strategic environmental assessment: key issues emerging from recent practice. Environmental Impact Assessment Review, 16(1), 31-55.

Pan X 2003, The causes of unbalanced development in national keep-fit programme' area and countermeasures on it, Journal of Chengdu Sport University, Vol 1918-21.

Pan X, 2006, a comparative study of the urbanization of China's west and east, Shaanxi normal university, master

Pan Y., 2007, Planning environmental impact ordinance is delayed because of the conflicts among departments. Http://news. Xinhuanet.com/fortune/2007-11/04/content_7008469.htm

Peng L 2010, master, Comparative study of the relation between economy and environment in China's eastern and western, Northwest A&F University

Peng X, Sci/Tech Information Development & Economy , 2003 Vol13, A summary of the development of electronic government affairs in China 75-77

Peng Z, A comparison between the current unbalanced development of higher education in the eastern and western regions of China, Comparative Education Research, 2002, Vol. 5 18-22

Rosenstein-Rodan.P, Problems of Industrialization of Eastern and South- Eastern Europe, Economic Journal 53, No. 210/211, (1943), pp.202–11.

Qi J, 2015.07.09, Xinhua Online, Develop the infrastructure to narrow the gap between the East and west of China

Qian H, 2009 Study of strategic environmental assessment applied in the process Industries (Boron Industry), doctor, , Northeastern University

Retief, F., Jones, C., & Jay, S. (2008). The emperor's new clothes—reflections on strategic environmental assessment (SEA) practice in South Africa. Environmental Impact Assessment Review, 28(7), 504-514.

Ren J., 2011.To carry out strategic environmental assessment right time, China Environmental News, 2011-10-10.

Resolution on Certain Questions in the History of Our Party Since the Founding of the People's Republic of China," adopted by the Sixth Plenary Session of the Eleventh Central Committee of the Communist Party of China on June 27, 1981 Resolution on CPC History (1949–81). Beijing: Foreign Languages Press, 1981.

Robertson, D.B., 1991. Political conflict and lesson-drawing. Journal of Public Policy, 11(01), pp.55-78.

Rose, R., 1993. Lesson-drawing in public policy: A guide to learning across time and space (Vol. 91). Chatam^ eNJ NJ: Chatham House Publishers.

Sadler, B., Verheem, R. and Bass, R., 1996. Strategic Environmental Assessment: Status, Challenges and Future Directions No. 53. Project Appraisal, 11(4), p.267.

Schmidt, M., Joao, E., & Albrecht, E. (Eds.). (2006). Implementing strategic environmental assessment (Vol. 2). Springer Science & Business Media.

Stone, D., 2001. Learning lessons, policy transfer and the international diffusion of policy ideas

Song J., Chen X. and Liu, Y., 2005, Integrated evaluation of environmental effects of West-East Power Transmission in Guangdong Province, Resource Scienenc, Vol.27, 47-54

Song L., 2006, the study of the problem and its countermeasure in pubcli policy execution, master, Northeast Normal University

Sun S. 2008. Study on the Effectiveness of Planning Environmental Impact Assessment in China. Tongji University. Shanghai. Master.

Tang, J, & Cheng, C. (2004). China regional development strategy under duality structure. China Opening Herald, 113(2), 86-90.

Tang T., 2009. The research on China's environmental impact assessment legal supervision. Kunming University of Science and Technology. Kunming. Master.

Tang X, Study on the countermeasures of regional gap between east and west of China , Jiangsu Social Sciences, 2000, Vol. 5 73-80

Therivel, R. (2004). Strategic environmental assessment in action. Routledge.

Wang H. 2013, doctor. Study on effectiveness of strategic environmental assessment in China. Nankai University. Tianjing.

Wang H. 2015, master, promotion of the duality of social organization in the administrative

litigation. East China University of Political Science and Law

Wang H., Xu H. and Lv, J., 2010. A Study on the status quo and effectiveness of strategic environmental assessment in China. Environmental Pollution and Control. Vol. 9. 103-106

Wang H. and Xu J., 2015. Study on strengthening whole process managment of planning environmental impact assessment. Environmental Science and Managment.Vol.40 No.11.182-186

Wang J., 2006. The comparison of China and other countries' environmental impact assessment systems-the proper law process of environment and development decision. Beijing University Press, 1st ed. Beijing.

Wang, J. and Tian Q. 2000, Green Justify-the law protection of environment. Guangzhou Press, 1st ed. Guangzhou.

Wang J., Qian Y., and Liu J., 2016. Planning environmental impact assessment development status and countermeasure analysis in Jiangsu Province as an example, Environment and Development, 28(2):23-26

Wang L., 2007. Research on environmental impact assessment law system. Zhengzhou University. Zhengzhou. Master.

Wang, J, & Zhang, X, & Zeng, Yu, 2001. The analysis of environmental protection integrated decision making . Journal of Jingmen Vocational Technical Collge, 16, 51-55.

Wang, M., 2005. Implement and countermeasures of strategical environmental assessment, Jounral of Environmental Management College of China. Vol. 15. 27-29

Wang S., Yang J., Lu Y. and Wu J., 2002. Development and application of strategic environmental assessment. Sichuan Environment. Vol 4. 34-37

Wang, S, & Yang, J, & Lu, Y,& Wu, J, 2002. Development and application of strategic environmental assessment . Sichuan Environment , 21, 34-37.

Wang X., 2009 The development, present situation and developing trend of electronic government affairs in China, 2006 E-Government 7, 2009(7):44-68

Wang X., 2012Study on the document examination system of environmental impact assessment of planning. Suzhou University. Suzhou. Master.

Wang X.,1989. A Comparative Study on China and US Environmental Impact Statement System. Forum on Law. Vol.1 36-40

Wang Y., 2006. Research on the legal problem of public participation in enviornmental impact assessment. Jilin University. Jinlin. Master.

Wang Y., Shang J. and Ding J., 2007. In strategic environment assessment alternative scheme formation and comparative analysis method. Jiangsu Environmental Science and Technology. Vol.6. 40-43

Wang, Z &Liu, S, & Xin, Y, 2002. Research on strategic environmental assessment. Journal of Lanzhou Railway University, 21, 129-132.

Wang, Y., Morgan, R. K., & Cashmore, M. (2003). Environmental impact assessment of projects in the People's Republic of China: new law, old problems. Environmental impact assessment review, 23(5), 543-579.

Wathern, P., 1988. The EIA directive of the European Community. Environmental Impact Assessment: Theory and Practice, Unwin Hyman, London.

Wathern, P. ed., 2013. Environmental impact assessment: theory and practice. Routledge.

Wei W and Bi C, 2011, Environmental regulation, regional industrial transfer and Pollution Haven Effect -an empirical analysis based on Provincial Panel Poisson model, Journal of Shanxi Finance and Economics University.2011 (8) : 69 - 75.

Wood, C., & Dejeddour, M. (1992). Strategic environmental assessment: EA of policies, plans and programmes. Impact Assessment, 10(1), 3-22.

Wood, C. and Jones, C.E., 1997. The effect of environmental assessment on UK local planning authority decisions. Urban Studies, 34(8), pp.1237-1257.

Wood, C., 2003, November. Environmental impact assessment in developing countries: an overview. In Conference on new directions in impact assessment for development: Methods and practice (Vol. 24, No. 25, p. 2003).

Wu J. and Chen F. 2008. China overall implemented construction projects environmental impact assessment system. 2008-10-28. Xinhua Net. http://www.npc.gov.cn/huiyi/1105/2008-10/28/content_1455463.htm.

Wu Q and Yang K, 2008, Thinking, 2008(S4) 10-13 The impacts of international NGOs on charitable activities in Yunnan

Wu, X., 2011, The research of industrial park environmental impact assessment, Science & Technology Association Forum, vol. 12,126-127.

Xia L and Ye J, 2005, A new category of Latin-Americanization -China society duality

analysis, Zhejiang Academic Journal, vol 1, 147-151

Xie, T, 2010. How west and middle areas undertake industrial transfer-specific interview of directors of NRDC. People's Daily Overseas Edition , 7 September 2010. 5.

Xie Ting, 2016, Impact of setting sub-regions on regional policy, Lanzhou University, master

Xiong Wei, 2014, Study on the regulation of tax preference policy in the view of law, China Legal Science, 2014(6): 154-168

Xinhua News, 2012.4.10. Yangtze River Delta ranks among the top six world urban agglomerationhttp://news.xinhuanet.com/city/2012-04/10/c_122954744.htm

Xu D., 2008. The thinking about China's current planning system. Economic issues exploration, Vol. 10. 181-185

Xu J, 2014, From ideal to reality - China's strategic planning EIA facilities status, problems and countermeasures, Ecological Economy, vol 3, Ecological Economy

Xu P, 2012,doctor,the research of U.S Economy "Dualism"-based on the relationship between economic development and employment, Nankai University.

Yang B, The economic zoning of China into eastern, central and western regions: unsuitable for the requirements of development, Journal of Guizhou College of Finance and Economics, vol.129, 2007,40-47

Yang H, 2005, A tentative research on the "duality" of tourism development in the minority areas of Lijiang, master, Yunnan Normal University

Yang, J, 2000. New development of environment influence appraisal under sustainable development target. Chongqing Environmental Science, 22, 28-30.

Yang, J, 2002. Strategic environmental assessment for the city transport system. Environmental Protection in Transportation, 23, 40-42.

Yang X and Liang S, The difference of structural capability between East and West and the structural capability of the West. 2007, 70-78 Journal of Yunnan University (Social Science Edition) Vol.6

Yang Y and Pan J, The central and western regions policy should shift to undertake industrial transfer, Economic Review, 2014.5, 71-76

Yao D 2016, Development of E-government in China in 2015 Informationize Research, vol

60,1-8

Yao S, 2004, Wuhan University, Master, Gap in economic between east and west China and its impacts

Ye M 2011,master, Nanchuang University, Virtuousness and viciousness: a study at the roots and essence of Humanity's dualism in Vanity Fair

Ye X, 2010, Study on dilemma and measures of non-governmental organizations and development in China, Guangdong Ocean University, master

Yin S and He P, 2016, An empirical study on the change trend of the income gap between urban and rural residents in the East and the West, Hubei Agricultural Sciences, Vol.55 No.4, 2016 1042-1046

Zhang, J., 2004, Analysis on the legislation actuality of China's SEA, Journal of Xinyang Normal University (Philos. &Soc. Sci. Edit.), Vol. 24, 24-27

Zhang L 2002, On methodology of Heheism, Journal of Renmin University of China, vol. 3 22-27

Zhang Z, Research on the effectiveness of industrial transfer policy, Modern Economic Research, 2011.10 P9-12

Zhan Z and Ye S, 2005, Measuring interregional disparity of western, middle and eastern districts by human development index, East China Economics Management, Vol19, 22-25

Zhang H. 2014. Driving Force for Companies to Protect Environment is Mainly from Governmental Regulation With Community Participation and Market Demand as Complement. Journal of Clean Production, 2014(10):1036-1045.

Zhang K., 2015. over 30 percent has been illegal among more than 1,100 EIA agencies nationwide. First Financial Daily. 2015-6-10.

Zhang K, Ren Li, Zhang J…Research and Practice on environmental impact assessment of urbanization development strategy 2010, China Environmental Science press, Beijing

Zhang M., 2013. EIA institutions decoupling restructuring and then starting. Public Policy. Vol. 5. 32-33.

Zhang Q., 2011. The analysis of planning environmental impact assessment follow-up assessment. Environment and Sustainable Development. Vol.2. 50-51

Zhang S., Li A, Xu P, Dai Z, Yi Y. and Xiong Y., Environmental Science and Management,

2010 (7), Overview on environmental impact assessment program for old industrial zone: a case study on Xinzha industrial park of Zhonnggulou Economic Development District of Changzhou, Jiangsu

Zhao M., 2014, Analysis on the role of county level municipal government in urban and rural planning, China Construction News, 2014-08-05.

Zhao Y, 2008, Chongqing University, master, Reasons & solutions for differences of population quality in east and west

Zhao, Y., Zhu, F. and He, Li., 2009. Definition, classification and evolution of environmental regulations, China Population, Resource and Environment,. Vol.19, P85-90

Zhao, Z. and Guan, T., 2016, "Thoughts and suggestions on improving the regional environmental regulation in China", Study & Exploration, Vol2, P85-91.

Zheng H, 2007, Dualistic religion, military and political tragedy and the Taiping Heavenly Kingdom, Jilin University, master.

Zhou K. and Shi Y., 2015. Analysis the independence of EIA institutes. Legal System Research. Vol.6. 135-141.

Zhou X., 2003, Development, planning and implementation of the project of power transmission from West China to East China, Power System Technology, Vol. 27, page1-5

Zhou Y., Guo R., Bao. C. and Huang A., 2009. Initially analyze planning enviornmental impact assessment follow-up assessment. Environment pollution and prevention. Vol. 6, 84-88.